The PHOTOFACT® Servicer

SET 537 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JULY 1961

CONTENTS PHOTOFACT SET 537

TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
AIRLINE	
WG-6030A, WG-6130A	537-1
PACKARD-BELL	
Chassis 98D11, 98D13, DPA-30, RM-500, RM-501, 8TU4	537-2
OTHER EQUIPMENT	
AIRLINE	
WG-2810A, WG-2811A, WG-2815A, WG-2816A, WG-2817A	537-3
ARVIN	
90P38 (Ch. 1.61001)	537-4
CORONADO	
PH13-4013A, PH13-4020B, PH13-4021B	537-5
CURTIS MATHES	
3015A, 3115A, 3215A (Ch. 15A)	537-6
DECCA	
DP-613	537-7
GOLDEN SHIELD	
900, 908, 980	537-8
KNIGHT	
KN-4060 (92RU774) (Tape Recorder)	537-9
LAFAYETTE	
HE-15, HE-16, HE-18	537-10
MADISON FIELDING	
Series 380	537-11
OLSON	
RA-338	537-12
SYLVANIA	
45P10	537-13

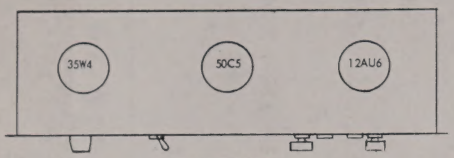
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

Philco Model
EF-5830

Silvertone Model
1331 (CH. 185.805)

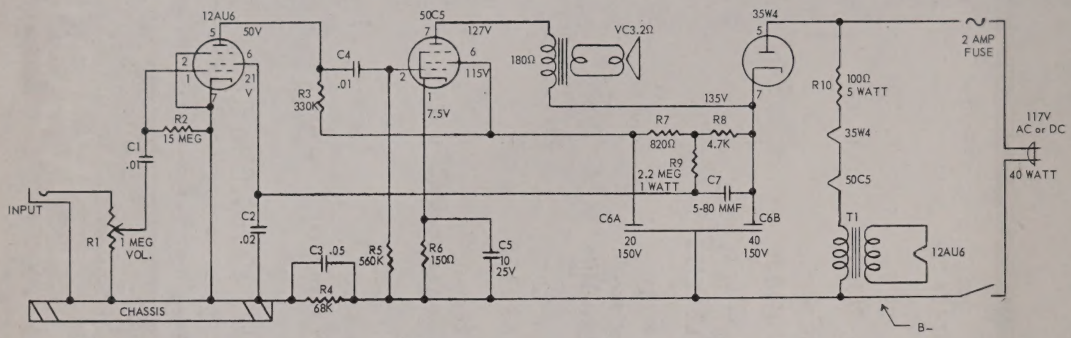
Silvertone Models
1430, 1451
(CH. 185.10001)



TUBE LAYOUT

NOTES:

1. VALUES OF CAPACITORS IN MFD. UNLESS OTHERWISE NOTED.
2. ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE NOTED.
3. VOLTAGES MEASURED FROM POINTS INDICATED TO B- WITH 20,000 OHM/VOLT METER.



CHASSIS PARTS

Schematic Location	Part No.	Description
		CAPACITORS
C1,C4	20-016	Tubular, .01 mfd., 600 v.
C2	20-026	Tubular, .02 mfd., 600 v.
C3	20-056	Tubular, .05 mfd., 600 v.
C5	25-1025	Electrolytic, 10 mfd., 25 v.
C6A-C6B	25-2040	Electrolytic, 20-40mfd., 150v.
C7	30-580	Trimmer, 5-80 mmfd.
		MISCELLANEOUS PARTS
	68	Fuse Holder
	2019	"On-Off" Switch
T1	TR12	Heater Transformer

Schematic Location	Part No.	Description
		RESISTORS (All Resistors ½ watt unless otherwise noted)
R1	22-10512	1 megohm, Volume
R2	18-15602	15 megohm, 20%
R3	18-33402	330K ohm, 20%
R4	18-68302	68K ohm, 20%
R5	18-56401	560K ohm, 10%
R6	18-15102	150 ohm, 20%
R7	18-82101	820 ohm, 10%
R8	18-47201	4.7K ohm, 10%
R9	18-22512	2.2megohm, 20%, 1w.
R10	18-10151	100 ohm, 10%, 5 w.

CABINET PARTS

Part No.	Description
1430C	Cabinet and Back (for Model 1430)
1451C	Cabinet and Back (for Model 1451)
128FBR	Leather Handle
2044B	Handle Hardware
632	6" Speaker with Output Transformer
1430MA	Owner's Manual
475-35	Control Knob, Brown

SILVERTONE MODELS 1430, 1451 (CH. 185.10001)

Information Courtesy of Sears, Roebuck & Company

CHASSIS PARTS

Schematic Location	Part No.	Description
CAPACITORS		
C1	20-016	Tubular, .01 mfd., 600 v.
C2,C4	20-026	Tubular, .02 mfd., 600 v.
C8	20-056	Tubular, .05 mfd., 600 v.
C5	25-2525	Electrolytic, 25 mfd., 25 v.
C6	30-40200	Trimmer Cond., 40-200 mmfd.
C7A–C7B	25-1010	Electrolytic, 10-10 mfd., 450 v.
C3	20-104	Tubular, .1 mfd., 400 v.
MISCELLANEOUS PARTS		
T1	31-5683	Output Transformer
T2	31-25969	Power Transformer
	31-68	Fuse Holder
	31-2019	"On-Off" Switch

Schematic Location	Part No.	Description
RESISTORS		
(All Resistors ½ watt unless otherwise noted)		
R1,R2	18-68302	68K ohm, 20%
R3	22-10513	1 megohm, Tone
R4	22-10512	1 megohm, Volume
R5	18-15602	15 megohm, 20%
R6	18-39402	390K ohm, 20%
R7	18-56402	560K ohm, 20%
R8	18-27111	270 ohm, 10%, 1 watt
R9	18-22502	2.2 megohm, 20%, 1 watt
R10	18-15201	1.5K ohm, 10%
R11	18-15301	15K ohm, 10%

CABINET PARTS

Part No.	Description
31-32	Cabinet and Back
31-128	Leather Handle
31-88	Handle Hardware
475-35	Control Knob, brown
31-186	Rubber Feet (4)
31-832	8" Speaker 3.2 ohm imp.
31-00	Instruction Sheet

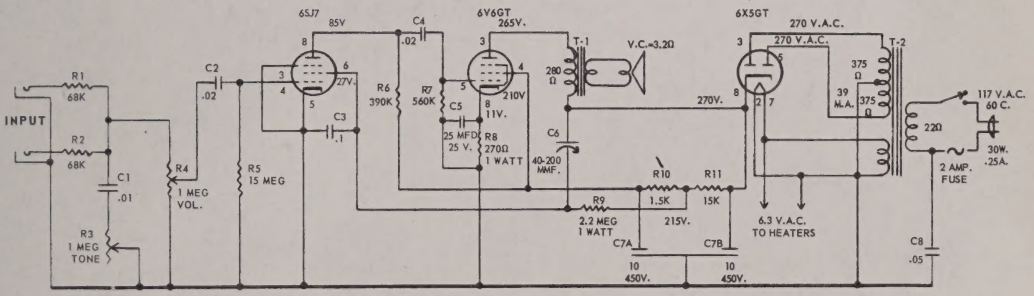
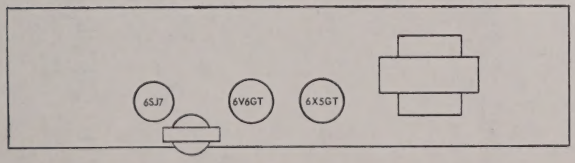


FIG. 1. SCHEMATIC DIAGRAM OF SILVERTONE CHASSIS 185.805

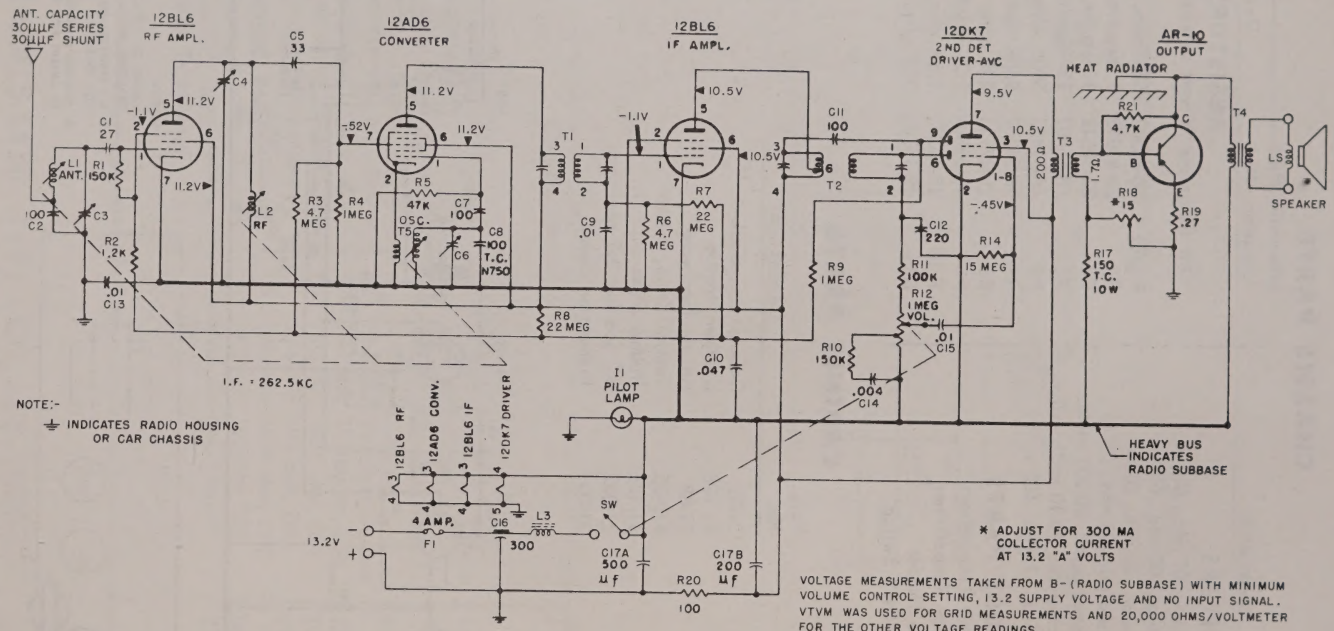


NOTES:

1. VALUES OF CAPACITORS IN MFD. UNLESS OTHERWISE NOTED.
2. ALL RESISTORS ARE ½ WATT UNLESS OTHERWISE NOTED.
3. VOLTAGES MEASURED FROM POINTS INDICATED TO CHASSIS WITH 20,000 OHM/VOLT METER.

SILVERTONE MODEL 1331 (CH: 185.805)

Information Courtesy of Sears, Roebuck & Company



VOLTAGE MEASUREMENTS TAKEN FROM B-(RADIO SUBBASE) WITH MINIMUM VOLUME CONTROL SETTING, 13.2 SUPPLY VOLTAGE AND NO INPUT SIGNAL. VTVM WAS USED FOR GRID MEASUREMENTS AND 20,000 OHMS/VOLTMETER FOR THE OTHER VOLTAGE READINGS.

PHILCO MODEL EF-5830

Schematic Diagram Courtesy of Philco Corporation

PHOTOFACT® Folder

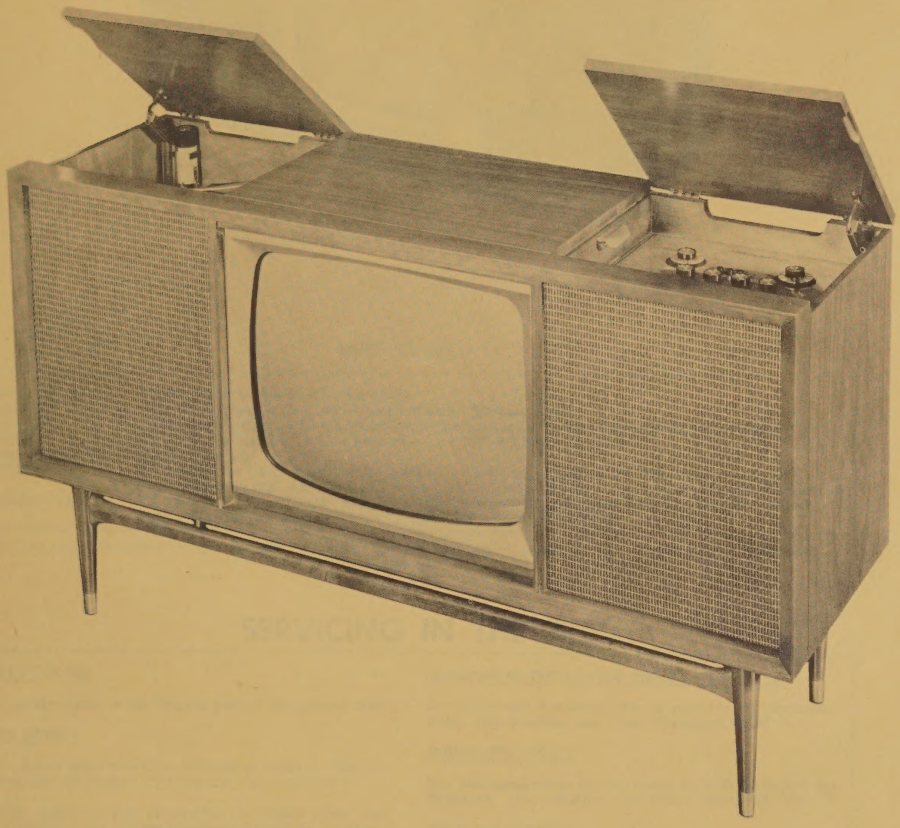
AIRLINE MODELS
WG-6030A, WG-6130A

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

AIRLINE MODELS
WG-6030A, WG-6130A



MODEL WG-6030A

AIRLINE MODELS
WG-6030A, WG-6130A

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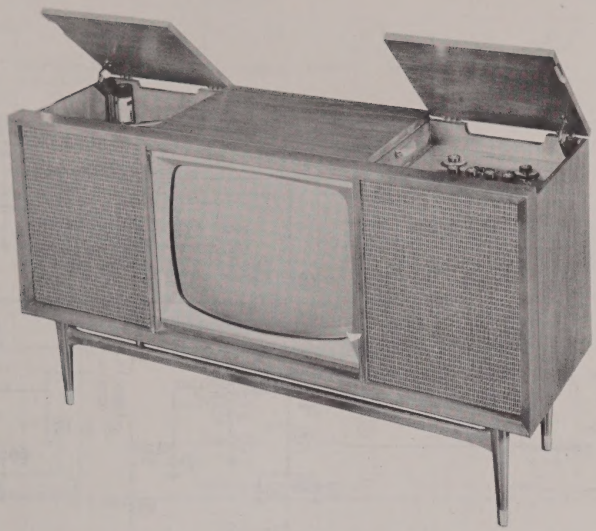
SET 537 FOLDER 1

PHOTOFACT® Folder

AIRLINE MODELS WG-6030A, WG-6130A

AIRLINE MODELS
WG-6030A, WG-6130A



MODEL WG-6030A

TRADE NAME	Airline, Models WG-6030A, WG-6130A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Avenue, Chicago, Illinois
TYPE SET	Television Receiver, FM-AM Radio (with Stereo Amp.), 4 Speed Automatic Record Changer *
TUBES	TV: VHF - Thirteen, UHF - Fourteen FM-AM Radio: Twelve
POWER SUPPLY	110-120 Volts AC, 60 Cycle
RATING	TV with Stereo Amp. (Switch in TV Position) - 215 Watts, 2 Amp. @ 117 Volts AC Radio (Switch in FM, AM, or Phono Position) - 95 Watts, .88 Amp. @ 117 Volts AC (less Phono Motor)
TUNING RANGE	TV: Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) Radio: FM - 88 to 108MC (10.7MC IF) BC - 535 to 1620KC (455KC IF)

* FOR SERVICE INFORMATION ON RECORD CHANGER – SEE SIMILAR V-M MODEL 1201 – PHOTOFACT SET 436 FOLDER 18

SERVICING IN THE FIELD

SAFETY GLASS

The safety glass is an integral part of the picture tube.

FUSE DEVICE

TV: A fuse wire is used for filament protection. (For location, see M3 in photo "TV Chassis - Bottom View".)

A 4.5Ω fusible resistor is used for low voltage power supply protection. (See "Tube Placement Chart" for location.)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of a Range Control. (For location, see "Tube Placement Chart".)

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive Trimmer. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz Control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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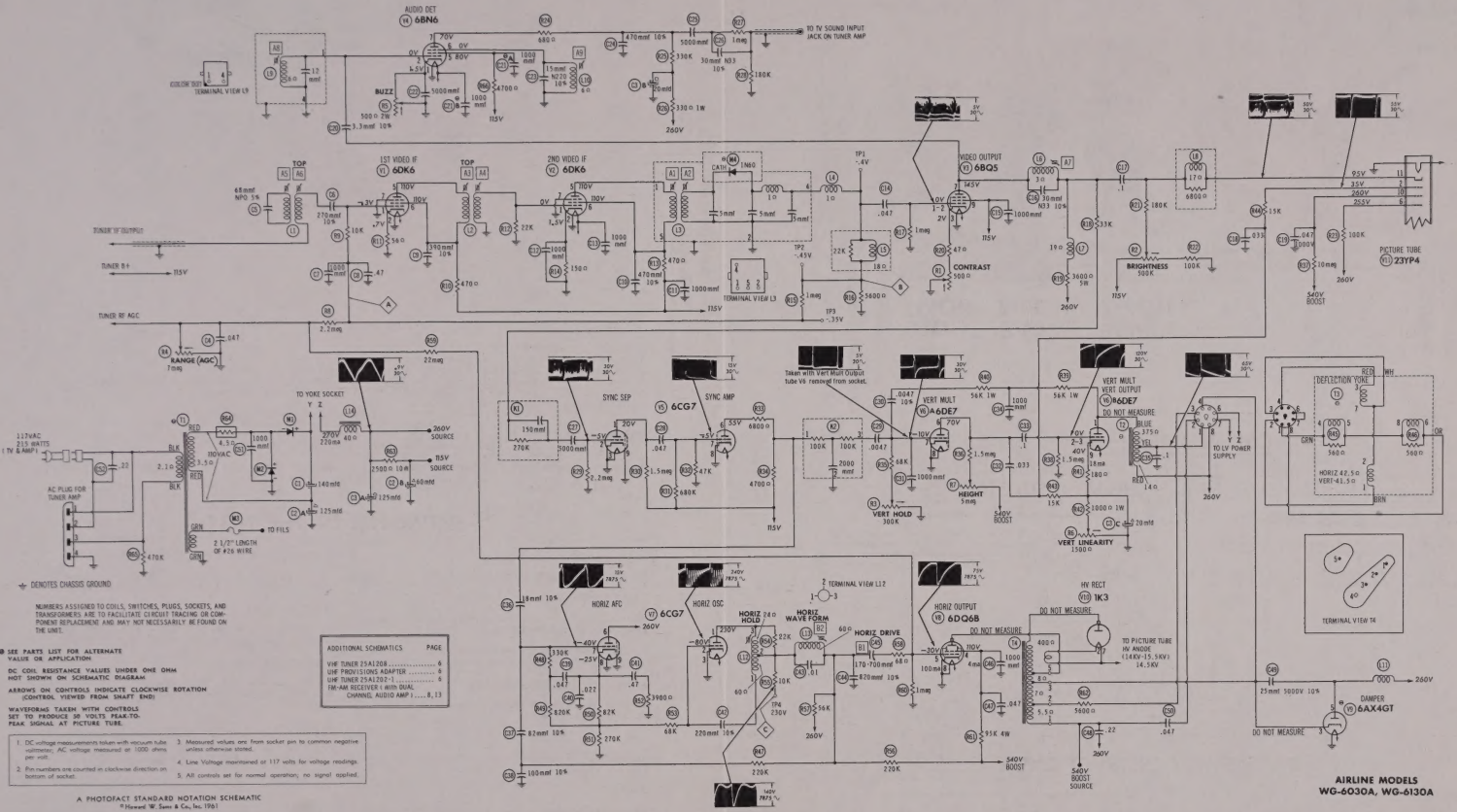
SET 537 FOLDER 1


AUDIO DET
V4 6BN6
TO TV SOUND INPUT JACK ON TUNER AMP
BUZZ
1ST VIDEO IF
V1 6DK6
2ND VIDEO IF
V2 6DK6
VIDEO OUTPUT
V3 6BQ5
CONTRAST
BRIGHTNESS
PICTURE TUBE
V11 23YP4
TUNER RF AGC
TUNER B+
RANGE (AGC)
TO YOKE SOCKET
117VAC
215 WATTS
(TV & AMP)
AC PLUG FOR TUNER AMP
TO FILS
SYNC SEP
SYNC AMP
V5 6CG7
VERT MULT
V6 6DE7
VERT MULT
VERT OUTPUT
V16 6DE7
DO NOT MEASURE
HEIGHT
VERT HOLD
VERT LINEARITY
TO LV POWER SUPPLY
DEFLECTION YOKE
HORIZ AFC
HORIZ OSC
V7 6CG7
HORIZ HOLD
HORIZ WAVE FORM
HORIZ DRIVE
HORIZ OUTPUT
V8 6DQ6B
HV RECT
V10 1K3
TO PICTURE TUBE HV ANODE (14KV-15.5KV) (4.5KV)
DAMPER
V9 6AX4GT
540V BOOST
540V BOOST SOURCE
260V SOURCE
115V SOURCE
TERMINAL VIEW L9
TERMINAL VIEW L3
TERMINAL VIEW L12
TERMINAL VIEW T4
Taken with Vert Mult Output tube V6 removed from socket.
DENOTES CHASSIS GROUND
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured on 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 25A1208 6
UHF PROVISIONS ADAPTER 6
UHF TUNER 25A1202-1 6
FM-AM RECEIVER (With DUAL CHANNEL AUDIO AMP) 8, 13
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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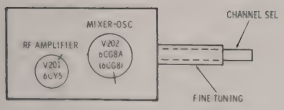
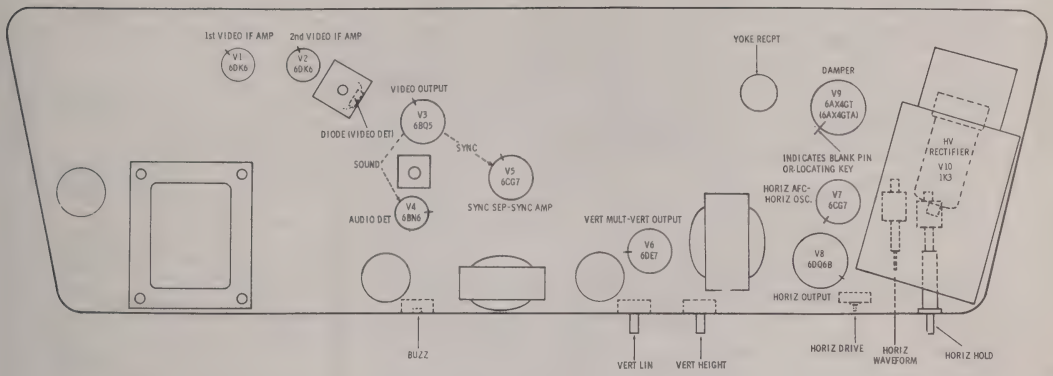
AIRLINE MODELS
WG-6030A, WG-6130A

TV TUBE PLACEMENT CHART



TOP VIEW



TUBE FAILURE CHECK CHART

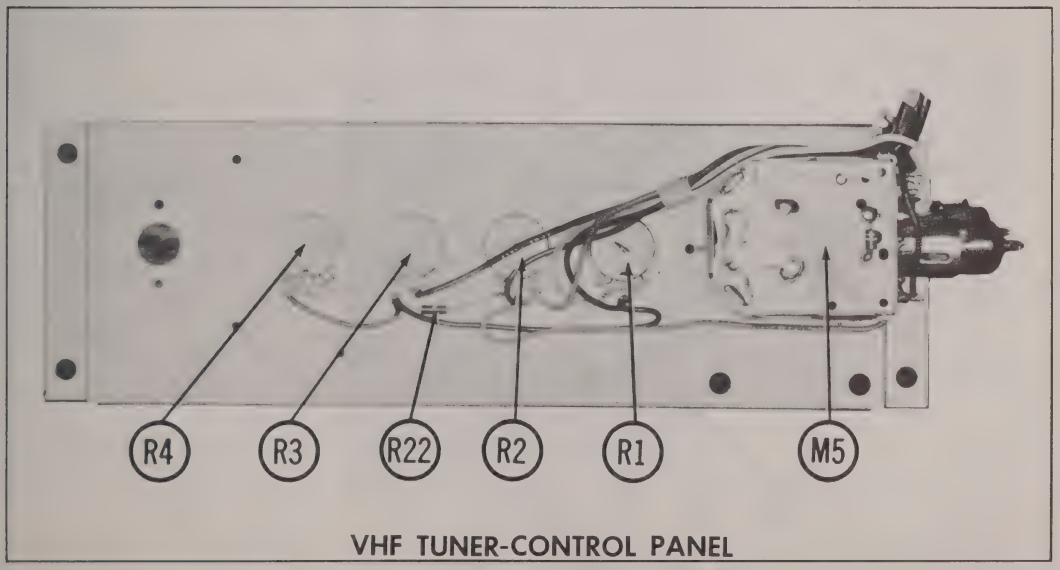
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor, Rectifiers (B+)

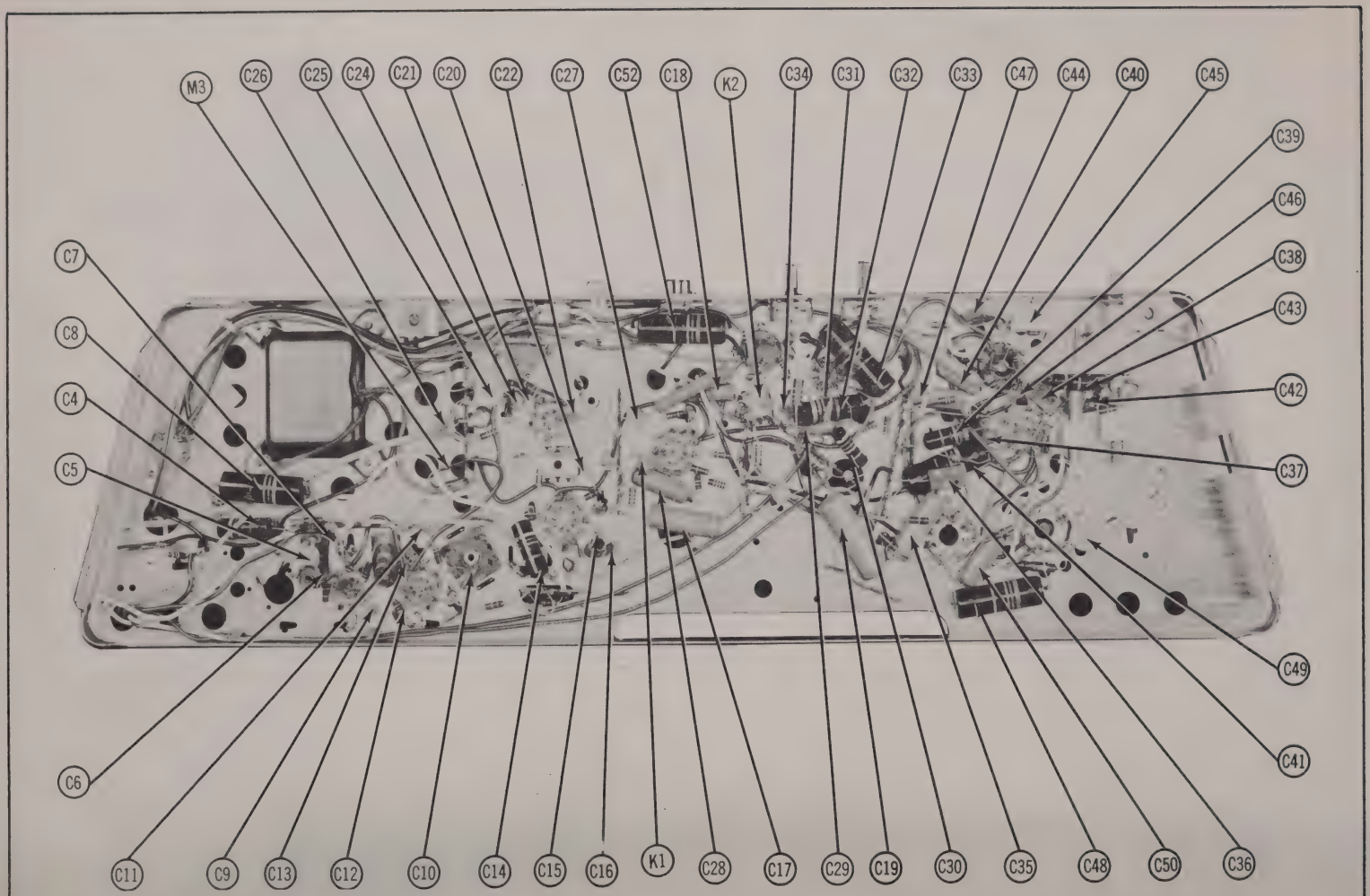
SWEEP FAILURE
No raster, has sound V7, V8, V9, V10, V11
No vertical deflection V6
Poor vert. linearity or foldover V6
Poor horiz. linearity or foldover V7, V8, V9
Narrow picture V7, V8, V9, Rectifiers (B+)
Vert. off freq. V6
Horiz. off freq. V7

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.)
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V11
Has pic, no sound V4, (See Amplifier)

SYNC FAILURE
No vert. sync V5
No horiz. sync V5
No vert. or horiz. sync V5



VHF TUNER-CONTROL PANEL



TV CHASSIS BOTTOM VIEW - CAPACITOR, MISC. IDENT.

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .01mfd to pin 1 (grid) of 2nd Video IF. Low side to chassis. Adjust output for 4VP-P on scope.	44.0MC (10MC Swp.)	42.4MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 47K to point (B). Low side to chassis. (Across Video Det. Load)	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 controls marker position and A2 controls gain and symmetry.
2.	High side thru .01mfd to pin 1 (grid) of 1st Video IF. Low side to chassis. Adjust for 4VP-P on scope.	"	42.4MC 43.5MC 44.5MC 45.75MC	"	"	A3, A4	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. A3 controls marker position and A4 controls gain and symmetry.
3.	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC 42.4MC 43.5MC 44.5MC 45.75MC	"	"	A5, A6, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. Adjust A5 to place 41.25MC marker in trap notch.

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to pin 2 (grid) of Video Output. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis. Use 0-10V AC scale.	A7	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV station and reduce the signal strength at the antenna terminals until a hiss is heard in the sound similar to super-regeneration.
Adjust A8, A9 and the Buzz control for maximum undistorted sound with MINIMUM buzz.
If the hiss disappears during adjusting, further reduce the signal strength.

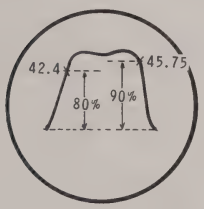


FIG. 1

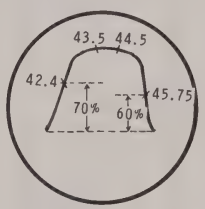


FIG. 2

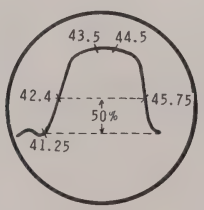
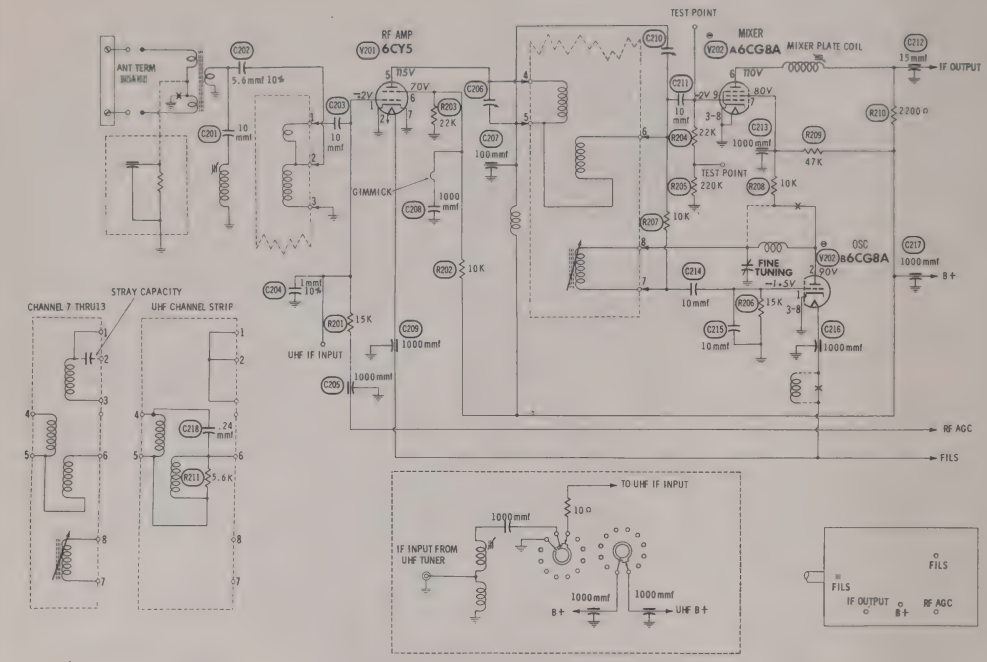


FIG. 3



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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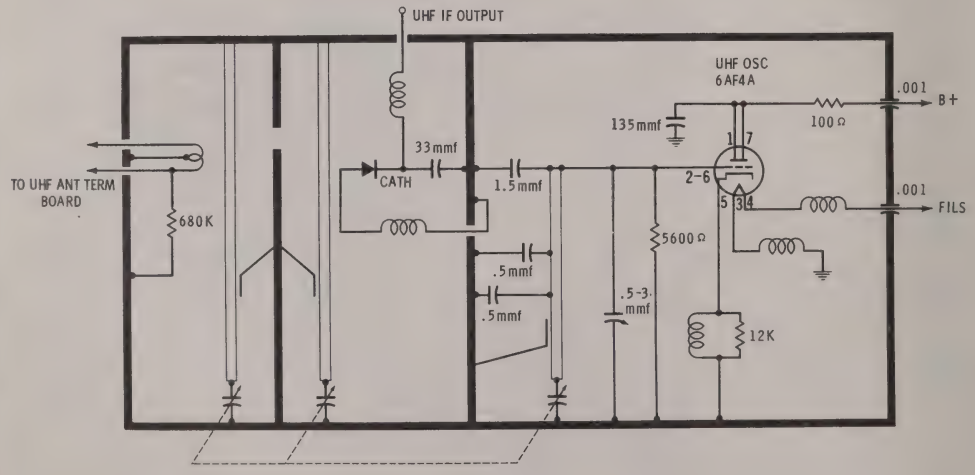
VHF TUNER 25A1208, UHF PROV. ADAPTER 2A523



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER 25A1202-1

FM-AM ALIGNMENT INSTRUCTIONS

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools: A1 thru A13 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A14, A15, A16 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A17, A18, A21, A22 .GENERAL CEMENT #8282, 8606, 8606L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A19, A20 ..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

AM ALIGNMENT - SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open	Across Voice Coil	A10, A11, A12, A13	Adjust for maximum output.
2.	High side thru 470Ω to external AM antenna terminal. Low side to chassis.	1600KC	1600KC	"	A14	"
3.	"	1400KC	1400KC Signal	"	A15, A16	Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM - SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to point (D). Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference	DC probe to point (E). Common to chassis.	A17, A18, A19, A20	Adjust for maximum deflection.
5.	"	"	"	DC probe thru 1meg to point (F). Common to chassis.	A21	"
6.	"	"	"	DC probe to point (G). Common to chassis.	A22	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE - SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to point (D). Low side to chassis.	10.7MC (450KC swp)	(FM) Point of non-interference	Vert. Amp. to point (E). Low side to chassis.	A17, A18, A19, A20	Adjust for maximum gain and symmetry of response similar to Fig. 5 with markers as shown.
5.	"	"	"	Vert. Amp. thru 47K to point (F). Low side to chassis.	A21	"
6.	"	"	"	Vert. Amp. to point (G). Low side to chassis.	A22	Adjust to place marker at the center of crossover lines similar to Fig. 3. SLIGHTLY retouch A21 for maximum amplitude and straightness of cross-over lines.

FIG. 5

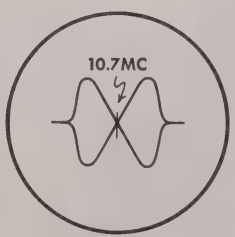
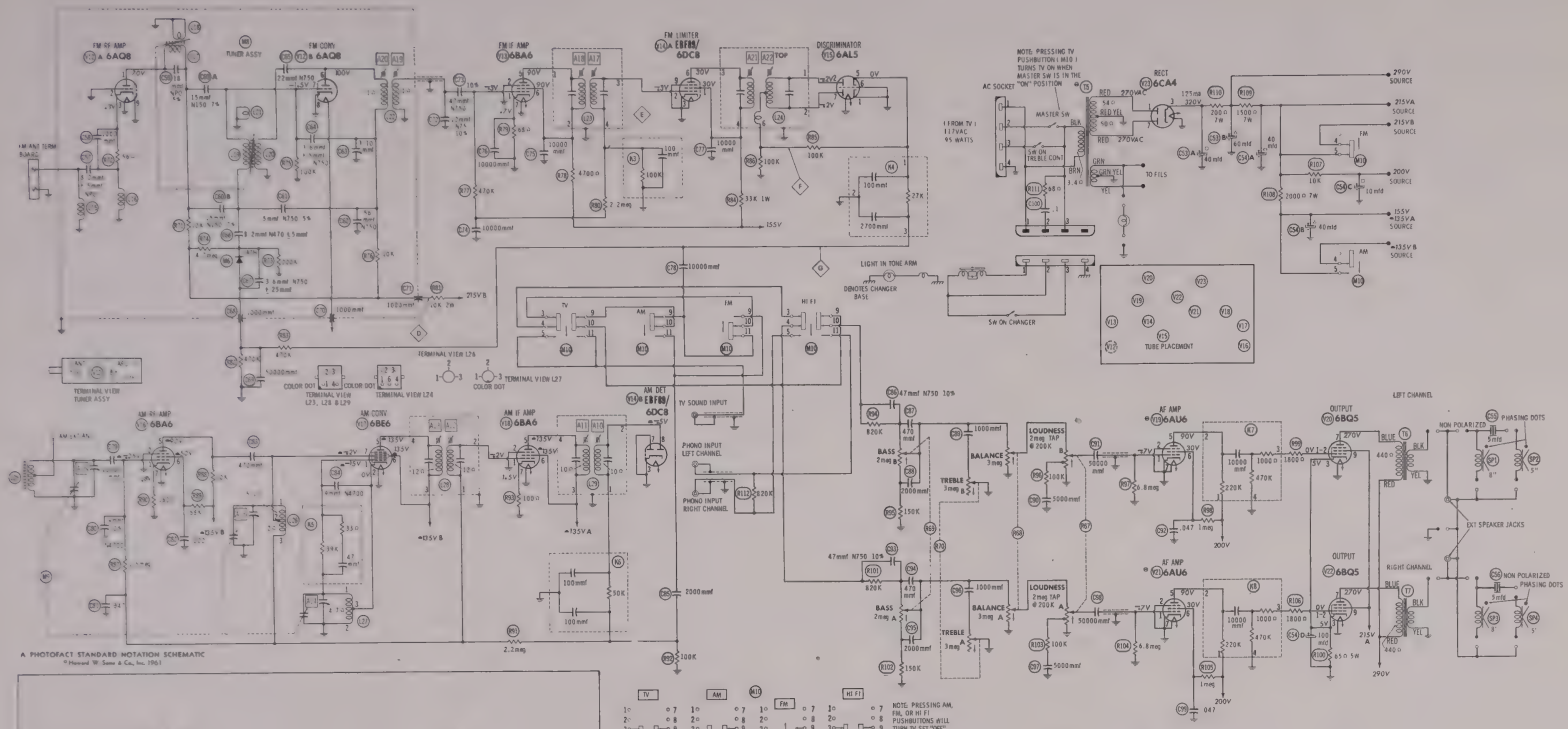
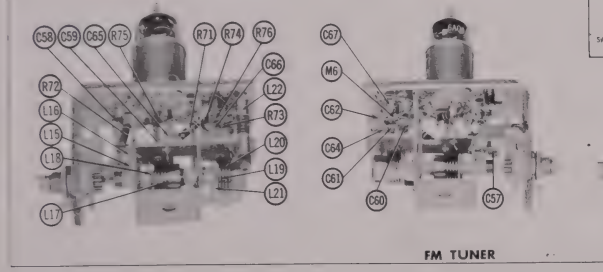
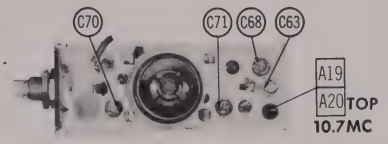


FIG. 6







FM TUNER

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V12	6AQ8	††22K	0Ω	56Ω	FIL	FIL	††22K	100K	0Ω	0Ω
V13	6BA6	2.8meg	0Ω	FIL	FIL	FIL	††8400Ω	††8400Ω	68Ω	
V14	EBF89 6DC8	††37K	100K	0Ω	FIL	FIL	††37K	0Ω	150K	0Ω
V15	6AL5	0Ω	100K	FIL	FIL	180K	0Ω	100K		
V16	6BA6	3.8meg	0Ω	FIL	FIL	▲††14K	▲††22K	180Ω		
V17	6B6	39K	2Ω	FIL	FIL	▲††3700Ω	▲††3700Ω	2.3meg		
V18	6BA6	2.3meg	0Ω	FIL	FIL	††3700Ω	††3700Ω	100Ω		
V19	6AU6	6.8meg	0Ω	FIL	FIL	††230K	††1meg	0Ω		
V20	6B05	NC	470K	65Ω	FIL	FIL	NC	††640Ω	NC	††1700Ω
V21	6AU6	6.8meg	0Ω	FIL	FIL	††230K	††1meg	0Ω		
V22	6B05	NC	470K	65Ω	FIL	FIL	NC	††640Ω	NC	††1700Ω
V23	6CA4	54Ω	NC	¶	FIL	FIL	NC	50Ω	NC	NC

ALL RADIO MEASUREMENTS MADE IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 3 OF V23. NC NO CONNECTION
▲ MEASURED IN "AM" POSITION.

FM-AM RECEIVER (WITH DUAL CHANNEL AUDIO AMP)

FM–AM RECEIVER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	GENERAL ELECTRIC • RAYTHEON • SYLVANIA • TYPE
V12	FM RF Amp. - FM Conv.	6AQ6
V13	FM IF Amplifier	6BA6
V14	FM Limiter - AM Det.	EBF89/6DC8 (6DC8) *
V15	FM Discriminator	6AL5
V16	AM RF Amplifier	6BA6
V17	AM Converter	6BE6
V18	AM IF Amplifier	6BA6
V19	Left Channel AF Amp.	6AU6 (7543) ▲
V20	Left Channel Output	6BQ6
V21	Right Channel AF Amp.	6AU6 (7543) ▲
V22	Right Channel Output	6BQ6
V23	Rectifier	6CA4

* Alternate ▲ Recommended Replacement

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	VOLT	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C53A	ø40	350	45X474	AFH2-40-50	A030D	FP137-2	TMS-1540	TVL-1534	
B	ø60	350			BR6035	TCT8	TD-40-350	TVA-1811	
C54A	ø40	350	45X475	AFH4-56-05	D0660	FP43L-7	TMQ-4592	TVL5-462L-8*	
B	ø40	350							
C	ø10	350							
D	100	15							
C55	5	10NP	45X426	PRS7405	BBR4-150	TCN105		TVANS-1110 *	
C56	5	10NP	45X426	PRS7405	BBR4-150	TCN105		TVANS-1110 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C57	5.2	NPO	±.5mmf		NPO-DI 5.2		C10Y52C			10TCC-Y52
C58	1000				BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C59	15	NPO	5%			TCZ-15	C10Q15C	"		CND-415	10TCC-Q15
C60A	15	N150	5%	#3L-033			"	"			10TCP-Q15
B	15	N150	5%				"	"			10TCP-Q15
C61	5	N750	5%			DTN-5	C10Y5U	CCTN-050	CN7-550		10TCU-Y50
C62	56	N750				TCN-56	C10Q56U	CCTN-560	CN7-456	10TCU-Q56	
C63	3-10					539-10					
C64	3.6	N750	±.5mmf						CN7-533	10TCU-V33	
C65	22	N750			N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCC-Q22	
C66	5.2	N470	±.5mmf					"			
C67	3.6	N750	±.25mmf						CN7-533	10TCU-V33	
C68	1000				EF-001	MPT-1000		CCF-102	CT280A		
C69	50000				BPD-05	DD-503	CUB685	6DP-3-503	GP150	5HK-B50	
C70	1000				EF-001	MPT-1000		CCF-102	CT280A		
C71	1000				EF-001	MPT-1000		CCF-102	CT280A		
C72	12	N75	10%	#6QX74				"			
C73	47	N750	10%		N750-DI 47	DTN-47	C10Q47U	CCTN-Q47	CN7-447		10TCU-Q47
C74	10000				BPD-01	DD-103	BYA10GI	CCD-103	B-110		5HK-S10
C75	10000				BPD-01	DD-103	BYA10GI	CCD-103	B-110		5HK-S10
C76	10000				BPD-01	DD-103	BYA10GI	CCD-103	B-110		5HK-S10
C77	10000				BPD-01	DD-103	BYA10GI	CCD-103	B-110		5HK-S10
C78	10000				BPD-01	DD-103	BYA10GI	CCD-103	B-110		5HK-S10
C79	10000				BPD-01	DD-103	BYA10GI	CCD-103	B-110		5HK-S10
C80	9	N470	10%	#4TX832				"			
C81	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147		47M-S47
C82	.022	400V			P288N-022	DD-303	CUB4S22	4DP-3-223	GEM-4122		47M-S22
C83	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347		10TS-T47
C84	9	N470		#4TX832				"			
C85	2000				BPD-002	DD-302	BYA10D2	CCD-302	B-230		5HK-D20
C86	47	N750	10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447		10TCU-Q47
C87	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347		10TS-T47
C88	2000				BPD-002	DD-302	BYA10D2	CCD-302	B-230		5HK-D20
C89	1000				BPD-001	DD-102	BYA10DI	CCD-102	B-210		5HK-D10
C90	5000				BPD-005	DD-502	BYA10D5	CCD-502	B-250		5HK-D50
C91	50000				BPD-05	DD-503	CUB685	6DP-3-503	GP150		5HK-S50
C92	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147		47M-S47
C93	47	N750	10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447		10TCU-Q47
C94	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347		10TS-T47
C95	2000				BPD-002	DD-302	BYA10D2	CCD-302	B-230		5HK-D20
C96	1000				BPD-001	DD-102	BYA10DI	CCD-102	B-210		5HK-D10
C97	5000				BPD-005	DD-502	BYA10D5	CCD-502	B-250		5HK-D50
C98	50000				BPD-05	DD-503	CUB685	6DP-3-503	GP150		5HK-S50
C99	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147		47M-S47
C100	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401		47M-P10

* Airline Part Number

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS - IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R87A	2meg		36X428	BT-174 **				Loudness, Right Channel
B	2meg w/ 200K Tap			STB-174 **				Loudness, Left Channel (** Do not use Tap #2)
R88A	3meg		36X429				FA36A	Balance, Right Channel
B	3meg						RU36R	Balance, Left Channel
C	Shaft						CS3500	
R86A	2meg		40X486	B-76	AD47-2meg-2		FA26A	Bass, Right Channel
B	2meg			SR-76	Not Req.		RU26A	Bass, Left Channel
C	Shaft			Not Req.	FS-3		CS3500	
R70A	3meg		40X495					Treble, Right Channel
B	3meg							Treble, Left Channel
C	Switch							Push-Pull, Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R71	10K			
R72	56Ω			
R73	220K			
R74	4.7meg			
R75	100K			
R76	10K			
R77	470K			
R78	4700Ω			
R79	68Ω			
R80	2.2meg			
R81	10K 2W			
R82	470K			
R83	470K			
R84	33K 1W			
R85	100K			
R86	100K			
R87	1.5meg			
R88	10K			
R89	68K			
R90	180Ω			
R91	2.2meg			
R92	100K			
R93	100Ω			
R94	820K			
R95	150K			
R96	100K			
R97	6.8meg			
R98	1meg			
R99	1800Ω			
R100	65Ω 5W	PW5-65	5W-SQ-65	
R101	820K			
R102	150K			
R103	100K			
R104	6.8meg			
R105	1meg			
R106	1800Ω			
R107	10K			
R108	2000Ω 7W	PW10-2000	10W-SQ-2000	
R109	1500Ω 7W	PW10-1500	10W-SQ-1500	
R110	200Ω 7W	PW10-200	10W-SQ-200	
R111	68Ω			
R112	820K			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA
K3	2nd FM IF Secondary	100mmf, 100K	76X28	
K4	FM Diode Filter	100mmf, 3700mmf, 27K	76X32	
K5	AM Osc. Coil Coupling	47mmf, 33Ω, 39K	76X20	
K6	AM Diode Filter	100mmf, 100mmf, 80K	76X26	Aerovox PA-97; Centralab PC-50; Sprague D-1
K7	Left Ch. Audio Coupling	10000mmf, 1000Ω, 220K, 470K	76X31	
K8	Right Ch. Audio Coupling	10000mmf, 1000Ω, 220K, 470K	76X31	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L15	RF Choke	34A-1002					
L16	RF Choke	34A-1002-01					
L17	FM RF	31T-3543					
L18	Trap	31X-338-01					
L19	FM Osc. Primary	31T-3683					
L20	FM Osc. Secondary	28RI-34JONR-92					
L21	Trap	31X-338-01					
L22	1st FM IF	31U-819					
L23	2nd FM IF	9A3440	FM-354	1463	RTC-8599	T633	
L24	Discriminator	9A3450	FM-356	1466	RTC-8600	T635	
L25	Loopstick	9A3474	BC-419	706-A		T523	
L26	AM RF	9A3473					
L27	AM Osc.	9A3472	BC-393	70-OSC	RTC-8647	T912	
L28	1st AM IF	9A3469	BC-353	12-C1	RTC-8633	T607	
L29	2nd AM IF	9A3470	BC-353	12-C2	RTC-8633	T608	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T5	117V @ .85A	540 VCT @ .128A DC	12.6 VCT @ 2.3A	53X39LA ①					① Alternate Part #53X39L

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T6	6500Ω	8-Ω	51X220-1	A-2901 ①	A-2313	23S88	A-56Z	① Drill new mounting holes.
T7	6500Ω	8-Ω	51X220-1	A-2901 ①	A-2313	23S88	A-56Z	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: AIRLINE PART No.	QUAM PART No.	NOTES
SP1	8"	PM	6-8Ω	12A570	8A12Z8	
SP2	5"	PM	6-8Ω	12A563	5A12Z8	
SP3	8"	PM	6-8Ω	12A570	8A12Z8	
SP4	5"	PM	6-8Ω	12A563	5A12Z8	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: AIRLINE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M8		34A-009				AFC

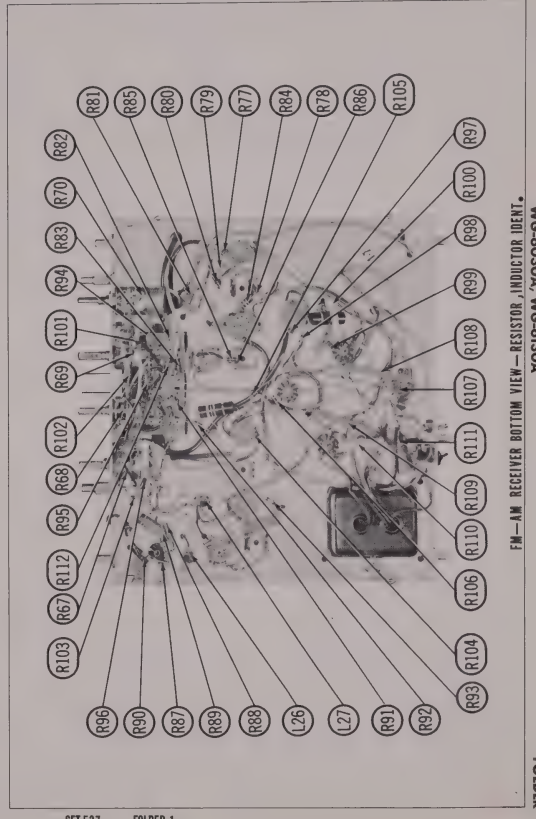
PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY

ITEM No.	REPLACEMENT DATA: AIRLINE PART No. CARTRIDGE	NEEDLE*	ASTATIC PART No. CARTRIDGE	NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	NEEDLE*	SONOTONE PART No. CARTRIDGE	NEEDLE*	NOTES
MT			17	Not Req.	388	8-J + 83-3 *	8TA-8	N-8TA-8	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M8	Tuner	25A1200	FM Complete, STANDARD COIL REPLACEMENT #6FA-231
M9	Tuning Cap.	14A242	AM, 3 Gang, Ant. 13-332mmf, RF 12-217mmf, Osc. 10-143mmf
M10	Switch	2A533	Pushbutton Type (Phono-FM-AM-TV Sound Position)



AIRLINE MODELS WG-6030A, WG-6130A

FM—AM RECEIVER BOTTOM VIEW—RESISTOR, INDUCTOR IDENT.

SET 537 FOLDER 1

FOLDER 1

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	GENERAL ELECTRIC • RAYTHEON • SYLVANIA • USE	TYPE
V1	1st Video IF Amp.	6DE6
V2	2nd Video IF Amp.	6DE6
V3	Video Output	6BQ6
V4	Audio Detector	6BN6
V5	Sync Sep.- Sync Amp.	6CG7
V6	Vert. Mult.- Vert. Output	6DE7
V7	Horiz. AFC - Horiz. Osc.	6CG7
V8	Horiz. Output	6DQ6B
V9	Damper	6AX4GT (6AX4GTA)*
V10	HV Rectifier	1K3

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: AIRLINE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V11	23YP4		23YP4 ①		23YP4 ②	① Aluminized ② Silver Screen "88"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	.140	150	45X43	AFHR-33	XA0381	FP15	TMS-1270	TVL-1429	
C2A	.125	300	45X447	AFH3-99-S2	D0045	WP319	TMT-3310	TVL-3574. 6	
B	.06	300							
C3A	.125	300	45X431	AFH4-03-60	XC0733. 2	FP330.24	TMQ-4146	TVL8-3574. 3 *	
B	.20	300							
C	.20	50							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.047	200V			P388N-047	DD-503	CUB3S47	4DP-3-473	GEM-4147	2TM-S47
C5	82	NPO	5%			DTZ-68	C10Q68C		CNO-468	10TCC-Q68
C6	270		10%		DZ-371	DD-371	L10T27	CCD-271	GP327	10TB-T27
C7	1000				BPD-001	DD-102	BYA10D	CCD-102	B-B10	5HK-D10
C8	.47	200V			P388N-47		CUB3P47	3DP-3-447	GEM-3047	2TM-P47
C9	390		10%		DZ-390	DD-391	L10T39	CCD-391	GP339	10TB-T39
C10	470		10%		DZ-470	DD-471	5RS747	CCD-471	GP347	10TB-T47
C11	1000				BPD-001	DD-102	BYA10D	CCD-102	B-B10	5HK-D10
C13	1000				BPD-001	DD-102	BYA10D	CCD-102	B-B10	5HK-D10
C13	1000				BPD-001	DD-102	BYA10D	CCD-102	B-B10	5HK-D10
C14	.047	200V			P388N-047	DD-503	CUB3S47	4DP-3-473	GEM-4147	2TM-S47
C15	1000				BPD-001	DD-102	BYA10D	CCD-102	B-B10	5HK-D10
C16	30	N33	10%							
C17	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C18	.033	600V			P488N-033	DD-303	CUB4S33	6DP-3-333	GEM-6133	6TM-S33
C19	.047	1000V			P068N-047		CUB10M7	10DP-3-103	GEM-10147	10TM-M47
C20	3.3		10%		NPO-3I 3.3	TCZ-3R3	C10Y33C	CCTO-3R3	CNO-333	10TCC-Y33
C21A	1000			Note 1	BPD-EX001	DD5-102	BYD6DD1	CCD-102	B3XE10	5HK-ED10
B	1000							CCD-102		
C22	5000				BPD-005	DD-502	BYA10D5	CCD-502	B-B50	5HK-D50
C23	15	N330	10%							10TCR-Q15
C24	470		10%		DZ-470	DD-471	5RS747	CCD-471	GP347	10TB-T47
C25	5000				BPD-005	DD-502	BYA10D5	CCD-502	B-B50	5HK-D50
C26	30	N33	10%							
C27	5000				BPD-005	DD-502	BYA10D5	CCD-502	B-B50	5HK-D50
C28	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C29	.0047	400V			P488N-0047	DS-472	CUB4S47	4DP-3-472	GEM-6347	6TM-D47
C30	.0047	400V	10%		V84CS4D4TM		PMS4D47	6DP-1-473	GEM-16347	6TM-D47
C31	1000				BPD-001	DD-103	BYA10D3	CCD-103	B-B10	5HK-D10
C32	.033	600V			P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33
C33	.1	600V			P688N-1	DF-104	CUB6P1	6DP-3-104	GEM-601	6TM-P10
C34	1000				BPD-001	DD-102	BYA10D	CCD-102	B-B10	5HK-D10
C35	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C36	18		10%		1469-000018	TCZ-18	2BR3G18	CM-19B-180K	CNO-418	MS-418
C37	82		10%		1469-000082	TCZ-82	2BR3Q82	CM-19B-820K	CNO-482	MS-482
C38	100		10%		1469-0001	TCZ-100	2BR5T1	CM-19B-101K	MCB325	MS-S10
C39	.047	200V			P388N-047	DD-503	CUB3S47	4DP-3-473	GEM-4147	2TM-S47
C40	.022	200V			P388N-033	DD-303	CUB3S33	4DP-3-333	GEM-6133	2TM-S33
C41	.47	200V			P388N-47		CUB3P47	3DP-3-447	GEM-3047	2TM-P47
C42	220	10%			1469-00022	TCZ-220	2BR5Q22	CM-19B-221K	CNO-322	MS-322
C43	.01	400V			P488N-01	DS-103	CUB4P1	4DP-1-103	GEM-411	4TM-S10
C44	330		10%		1469-00033		5RS782	CM-19B-331K	MCB251	MS-332
C45	170-700			6TA278				469		
C46	1000				BPD-001	DD-102	BYA10D	CCD-102	B-B10	5HK-D10
C47	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C48	.22	400V			P388N-33		CUB4P22	4DP-3-224	GEM-4023	4TM-P22
C49	25	5000V	10%						6DY-427	
C50	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C51	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-B10	5HK-D10
C52	.22	400V			P488N-22		CUB4P22	4DP-3-224	GEM-4023	4TM-P22

Note 1. May not be used in some versions. # Airline Part Number

CONTROLS

ITEM No	RATING: RESIST-ANCE	WATTS	REPLACEMENT DATA: AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500Ω	½	40X501	B-415		Q17-105	U52R	Contrast
R2A	500 K	½	40X498	B-59	A47-500K-S	QU-133	U50	Brightness
B	Shaft			Not Req.	FS-2	Not Req.	Not Req.	
R3A	300K	½	40X489	B-50	A47-300K-S	Q8-131	U46	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4	Temp *	½	40X500					Range (AGC)
R5	500Ω	2(WW)	40X472			110-500	PTL-500	Buss
R6A	1500Ω	½	40X464-2	T7-511	B47-1500-6	BH-109	PTA152L	Vert. Linearity
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	

CONTROLS (cont)

ITEM No.	RATING: RESIST-ANCE	WATTS	REPLACEMENT DATA: AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R7	5meg	↓	40X491	T7-87	B47-5meg-S	HLC5	PTA56L	Height

* Open at low end.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R8	2.2meg			
R9	10K			
R10	470Ω			
R11	56Ω			
R12	22K			
R13	470Ω			
R14	150Ω			
R15	1meg			
R16	5600Ω			
R17	1meg			
R18	33K			
R19	3600Ω 5W	PW5-3600	5W-SQ-3600	
R20	47Ω			
R21	180K			
R22	100K			
R23	100K			
R24	680Ω			
R25	330K			
R26	330Ω 1W			
R27	1meg			
R28	180K			
R29	2.2meg			
R30	1.5meg			
R31	680K			
R32	47K			
R33	6800Ω			
R34	4700Ω			
R35	68K			
R36	1.5meg			
R37	10meg			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R38	1.5meg			
R39	56K 1W			
R40	56K 1W			
R41	180Ω			
R42	1000Ω 1W			
R43	15K			
R44	15K			
R45	560Ω			
R46	560Ω			
R47	330K			
R48	330K			
R49	820K			
R50	82K			
R51	270K			
R52	3900Ω			
R53	68K			
R54	22K			
R55	10K			
R56	220K			
R57	56K			
R58	680K			
R59	22meg			
R60	1meg			
R61	95K 4W	PW5-95K	5W-SQ-95K	
R62	5800Ω			
R63	2500Ω 10W	PW10-2500	10W-SQ-2500	
R64	4.5Ω	FH5.0	F4.7	Fusible Type
R65	470K			
R66	4700Ω 1W			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA
K1	Sync Sep. Grid	150mmf, 370K	76X16	Aerovox PA-431 Centralab PC-60
K2	Vert. Integrator	2000mmf, 100K, 100K	76X19	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No	NOTES
L1A	1st Video IF	9A3436	TV-156	6231 †	RTC-8552 †	T224 †	①Includes complete ass'y. ②Wound on 22K Resistor. ③Wound on 6800Ω Res.
B		41.25MC Trap					
L2	2nd Video IF	9A3444				T279	
L3A	3rd Video IF	9A3435 ①					† Disregard Secondary winding. ▲Parallel with 22K Resistor. *Parallel with 6800Ω Resistor.
B	Peaking (30uh)		TV-180	6176	RTC-8593	T306	
L4	Peaking (30uh)	9A2375	TV-180	6176	RTC-8593	T306	
L5	Peaking (290uh)	36A23 ②	TV-159 ▲	6155 ▲	RTC-8587 ▲	T318 ▲	
L6	4.5MC Trap	9A2366	TV-151	1469	RTC-8603	T280	
L7	Peaking (325uh)	36A27	TV-200	6132	RTC-8577	T319	
L8	Peaking (270uh)	36A45 ②	TV-198 *	6130 *	RTC-8576 *	T316 *	
L9	Sound IF	9A2434	TV-154	1470-A	RTC-8604	T347	
L10	Quadrature	9A2387	TV-131	1480	RTC-8605	T251	
L11	RF Choke (1.5uh)	9A2380	RC-563	4804	RTC-8516	T256	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	Workman TV PART No.
L12	Horiz. Osc.	9A3481	TV-159	6231		RTC-8623	HS-7	WLC-25	T129
L13	Horiz. Waveform	9A3372	MWC-12	6315	QRC104	RTC-8626	HS-8	WLC-3	T110

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
L14	.220A	40Ω	1 Hy.	52X95-11					

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T1	117V ④ 1.12A	110V ④ .700A AC	6.3V ⑤ 7.5A	53X396A ①	P-6083			R-126BC	①Alternate Part #63X395.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T2	Vert. Output	51X207-1A	A-2855	VO-26 ②	VO-108	26873 ①	A-142X ③	
T3	Alt. Vert. Output	51X207						
	Yoke (Horiz. 24MH) (90°) (Vert. 40MH)	9A2482-4-A				Y-45 ④	Y-45 & NW1	
	Alt. Yoke	9A2482						
	Rear Cover and Centering Device							
	Yoke Clamp	30X811						
T4	Horiz. Output	53X389	HVO-174					

① Drill new mounting hole(s). ② Connect as autoformer. ③ Cut and tape Red/Black Lead. ④ Remove jumper across Yoke Terminals #3 and #6. Connect Yoke Terminal #1 to Plug Pin #4; Yoke Terminals #2 and #7 to Plug Pin #3; Yoke Terminals #3 to Plug Pin #2; Yoke Terminal #6 to Plug Pin #1; Yoke Terminal #4 to Plug Pin #6.

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: AIRLINE PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.220A	66X23	1N1763	40H	SR500	
M2	.220A	66X23	1N1763	40H	SR500	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: AIRLINE PART No. FUSE	AIRLINE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	21" length of #26 wire							

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: AIRLINE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M4	1N80 * 1N87 + 1N87A + CK-706A +	66X30 *		1N80 *	1N80 *	*Crystal Diode, Video Det., Pigtail +Alternates

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M5	Tuner	25A1208	VHF
	Tuner	25A1202-1	UHF

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

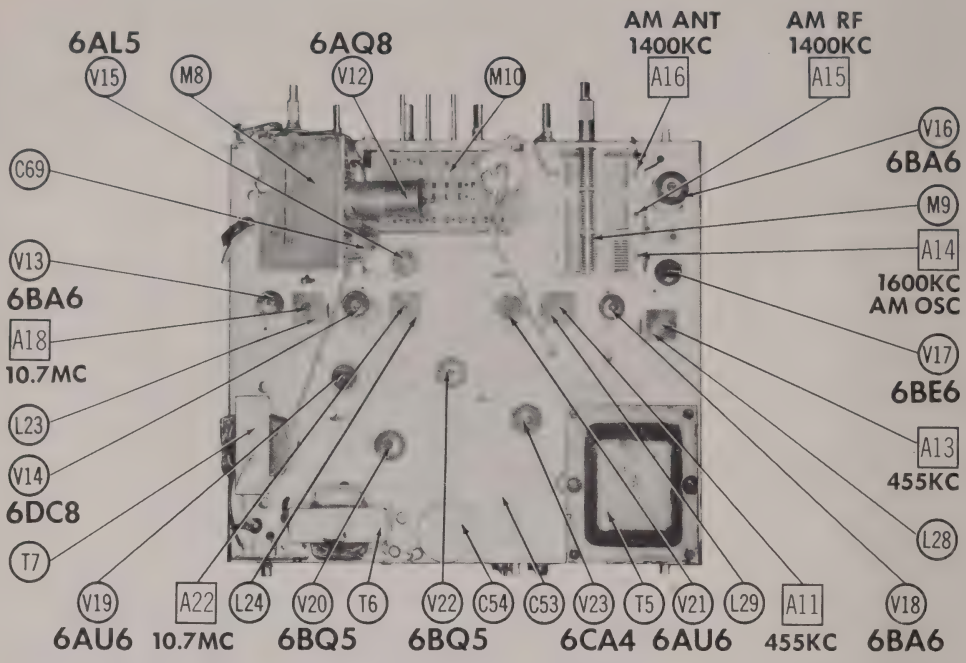
NAME	PART NO.	DESCRIPTION
Mask	4X1551-1	Picture Tube
Knob	10A1016-2	UHF Channel Selector, Model WG6130A
Knob	10A1017-2	UHF Channel Indicator, Model WG6130A
Knob	10A1006-1	VHF Channel Selector
Knob	10A1001-2	Fine Tuning
Knob	10A1006-2	FM Tuning
Knob	10A1010	FM Tuning Indicator
Knob	10A1007-3	AM Tuning
Knob	10A1014	AM Tuning Indicator
Knob	10A1028-2	Brightness, Contrast, Vertical, Range
Knob	10A1018-1	Horizontal Hold
Knob	10A1038-1	Loudness, Bass, Balance, Treble
Pushbutton	10A1009	Radio
Leg	8LX39-1	Front
Leg	8LX41-1	Rear
Rail Stretcher	8LX40-1	

WIRING DATA

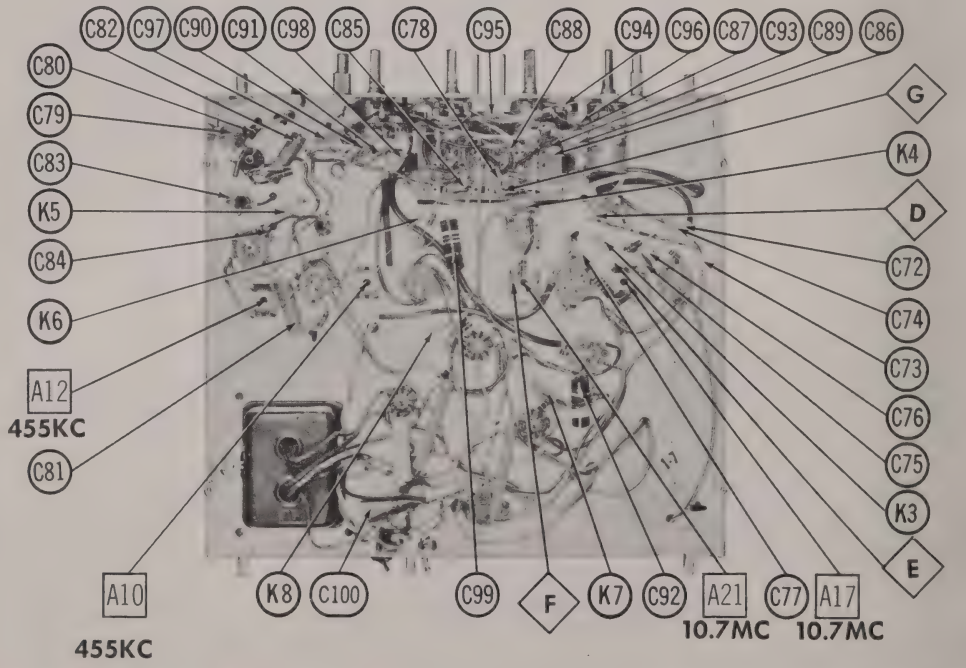
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8474
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8484 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

AIRLINE MODELS WG-6030A, WG-6130A

FOLDER 1



FM-AM RECEIVER - TOP VIEW



FM-AM RECEIVER BOTTOM VIEW - ALIGN., CAPACITOR, MISC. IDENT.

VHF TUNER PARTS LIST AND DESCRIPTIONS

25A1208

TUBES

• GENERAL ELECTRIC •			RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6CY5	V202	Mixer - Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C202	5.6 10%							10TCC-V56
C203	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C204	1 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C205	1000		EF-001	MFT-1000		CCF-102	CT280A	
C206								
C207	100		EF-0001	MFT-100				
C208	1000		DI-1000	DD-1000	BYA10D1	CCD-102	GP210	10TS-D10
C209	1000		EF-001	MFT-1000		CCF-102	CT280A	
C210								
C211	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C212	15							
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C215	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	.24							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	15K				R207	10K			
R202	10K				R208	10K			
R203	22K				R209	47K			
R204	22K				R210	2200Ω			
R205	220K				R211	5600Ω			
R206	15K								

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

VHF OSCILLATOR ALIGNMENT

The individual channel adjustment screws are accessible one at a time thru a hole in the front of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to the channel to be adjusted. Adjust for best picture and sound.

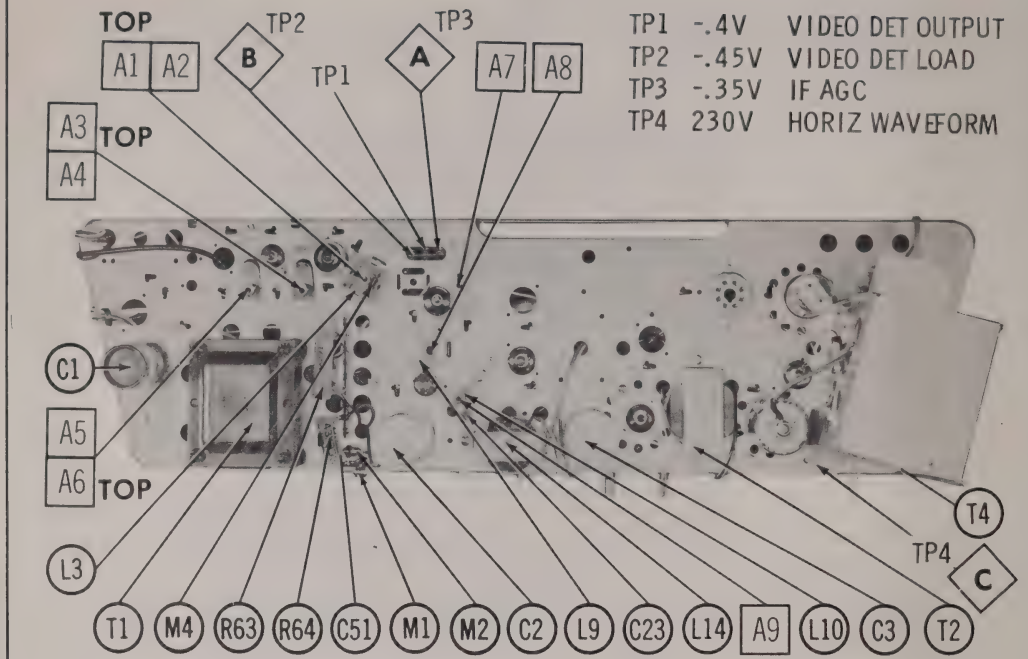
VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

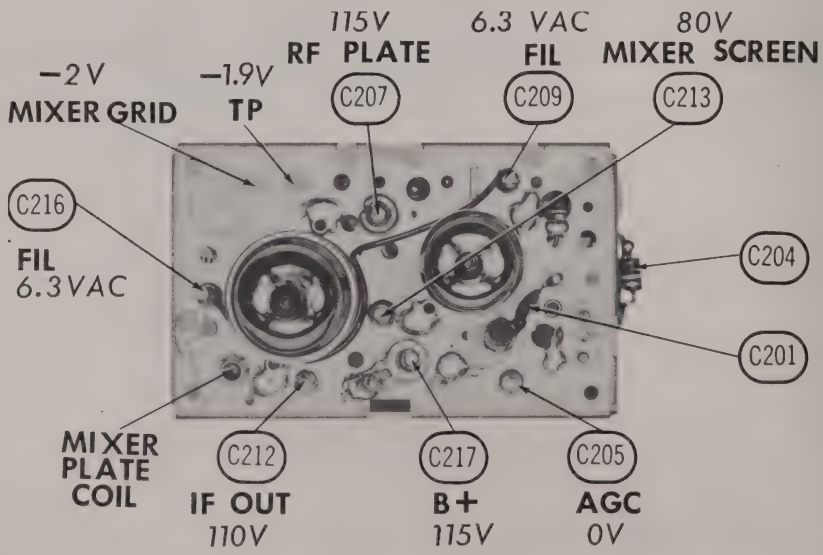
UHF TUNER

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

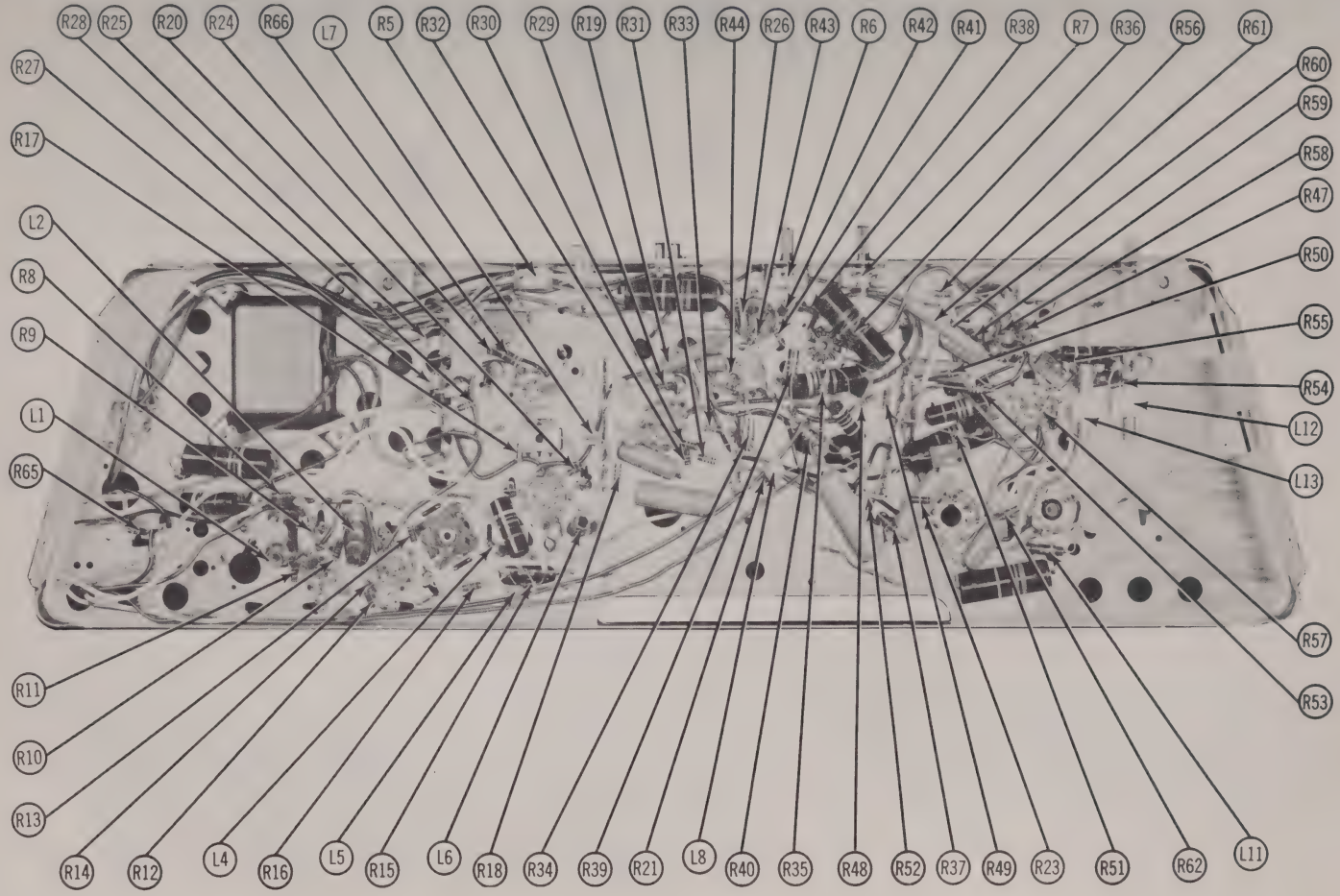
VHF TUNER 25A1208 BOTTOM VIEW



TV CHASSIS - TOP VIEW



VHF TUNER 25A1208 - TOP VIEW



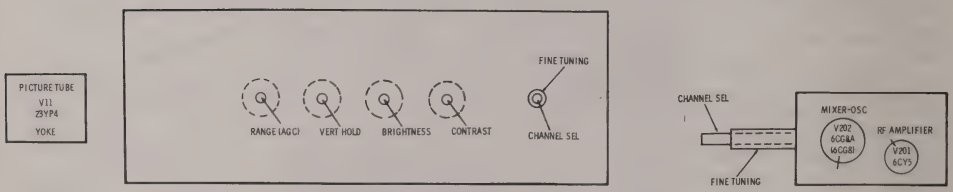
TV CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR IDENT.

TV RESISTANCE MEASUREMENTS

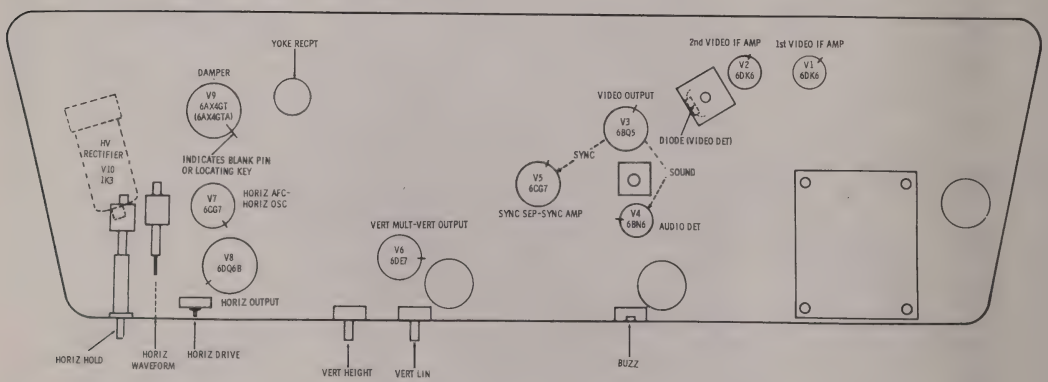
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DK6	• 800K	56Ω	FIL	FIL	†3000Ω	†3000Ω	0Ω		
V2	6DK6	.1Ω	150Ω	FIL	FIL	†3000Ω	†3000Ω	0Ω		
V3	6BQ5	NC	1meg	• 60Ω	FIL	FIL	NC	†3600Ω	NC	†2500Ω
V4	6BN6	• 180Ω	6Ω	FIL	FIL	†7200Ω	6Ω	†330K		
V5	6CG7	†1.5meg	2.2meg	0Ω	FIL	FIL	†12K	47K	0Ω	0Ω
V6	6DE7	†430Ω	NC	1.5meg	FIL	FIL	• †3meg	150K	0Ω	• 2000Ω
V7	6CG7	†56K	400K	0Ω	FIL	FIL	†40Ω	1.5meg	410K	0Ω
V8	6DQ6B	TP	FIL	TP	ǂ95K	1meg	TP	FIL	0Ω	TOP CAP ǂ8Ω
V9	6AX4GT	TP	NC	†280K	NC	†40Ω	TP	FIL	FIL	
V10	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ǂ410Ω
V11	23YP4	FIL	32K	Pin 6 †100K	Pin 10 ǂ10meg	Pin 11 • 300K	Pin 12 FIL			
V201	6CY5	• 200K	0Ω	FIL	FIL	†2500Ω	†10K	0Ω		
V202	6CG8A	15K	†10K	0Ω	FIL	FIL	†4700Ω	†21K	0Ω	240K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1.
ǂ MEASURED FROM PIN 3 OF V9.

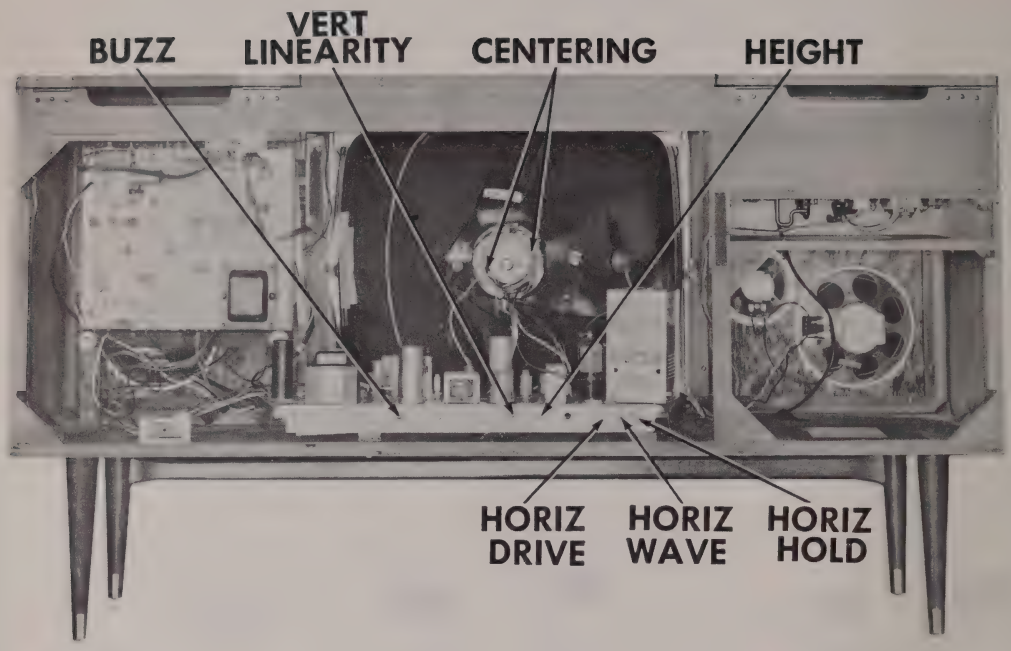
NC NO CONNECTION
TP TIE POINT



BOTTOM VIEW



TV
TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station. Adjust the Horizontal Hold (Freq. Slug) until the picture synchronizes horizontally.

Turn the Contrast fully counterclockwise and the Brightness clockwise so that the picture appears to be washed out.

Turn the Horizontal Drive Trimmer (B1) counterclockwise until white vertical bars (drive lines) appear in the left center portion of the raster, then counterclockwise until the white vertical bars disappear.

Connect the vertical amplifier of the scope thru a low capacity probe to point ⓒ. Low side to chassis. Adjust the Horizontal Waveform Slug (B2) until the round and sharp peaks of the waveform are equal in amplitude. See Figure 4. Keep the picture in sync during this adjustment with the Horizontal Hold.

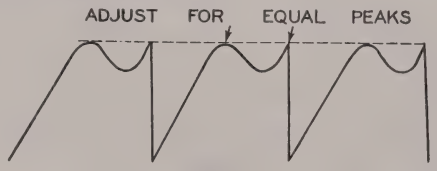


FIG. 4

DISASSEMBLY INSTRUCTIONS

TV CHASSIS REMOVAL

1. Remove all TV (push-on type) knobs at top of cabinet.
2. Remove 20 wood screws holding rear cover.
3. Disconnect picture tube socket, yoke plug, hi voltage lead, picture tube mounting bracket ground lead, and speaker leads.
4. Disconnect antenna leads from VHF Tuner.
5. Remove ground strap (from chassis to VHF Tuner).
6. Remove 4 screws holding VHF Tuner and control panel.
7. Remove 4 chassis bolts.
8. Disconnect cable plug from Radio.
9. Remove chassis.

PICTURE TUBE REMOVAL

It is necessary to remove the TV chassis for picture tube removal.

PHOTOFACT® Folder with CIRCUITRACE®

PACKARD-BELL CHASSIS 98D11, 98D13, DPA-30, RM-500, RM-501, 8TU4

PACKARD-BELL CHASSIS 98D11, 98D13, DPA-30, RM-500, RM-501, 8TU4

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 23DK2

PACKARD-BELL CHASSIS 98D11, 98D13, DPA-30, RM-500, RM-501, 8TU4

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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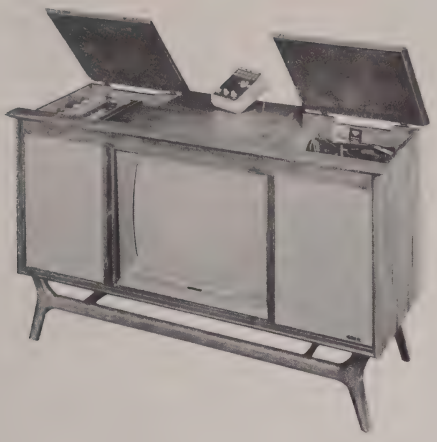
SET 537 FOLDER 2

PACKARD-BELL CHASSIS 98D11, 98D13, DPA-30, RM-500, RM-501, 8TU4

PACKARD-BELL CHASSIS 98D11, 98D13, DPA-30, RM-500, RM-501, 8TU4



MODEL 23DK2

TRADE NAME	PACKARD-BELL MODELS	TV Chassis	Remote Control	FM-AM Tuner	Stereo Amp.	VHF Tuner
	23DD4, 23DD6	98D11	RM-500			10643B
	23DK2	98D13	RM-501	8TU4	DPA-30	10643B
MANUFACTURER	Packard-Bell Electronics Corp., Service Div., 1920 So. Figueroa St., Los Angeles 7, Calif.					
TUBES	TV: VHF - Twenty FM-AM Tuner: Eight Stereo Amp.: Seven					
POWER SUPPLY	110-120 Volts AC, 60 Cycle					
RATING	TV, FM-AM Tuner, Stereo Amp. (Selector Switch in TV position) - 385 Watts, 3.4 Amp. @ 117 Volts AC (470 Watts, 3.7 Amp. While Tuning with Remote)					
	TV Only - 250 Watts, 2.25 Amp. @ 117 Volts AC					
	FM-AM Tuner (Selector Switch in any position except TV) - 155 Watts, 1.4 Amp. @ 117 Volts AC					
	In TV position (Off at Remote Control) - 9 Watts, .1 Amp. @ 117 Volts AC					
TUNING RANGE	TV: Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)					
	FM-AM Tuner: FM 88-108MC (10.7MC IF) BC 530-1620KC (455KC IF)					

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR UNIT - PHOTOFACT SET 482 FOLDER 11

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Press bottom center of safety glass back firmly. Insert a business card between safety glass and metal trim (left of center). Slide card to right to depress spring. Lift metal trim at bottom straight up. Remove safety glass.

FUSE DEVICE

TV: A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

Oscillator Adjust. screws are accessible thru hole in rear cover.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus Control. (See "Tube Placement Chart" for location.)

SYNC STABILITY

Sync stability may be varied by means of an ANI Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width Coil. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive Control. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Ratio Detector secondary(A13) at bottom of chassis.

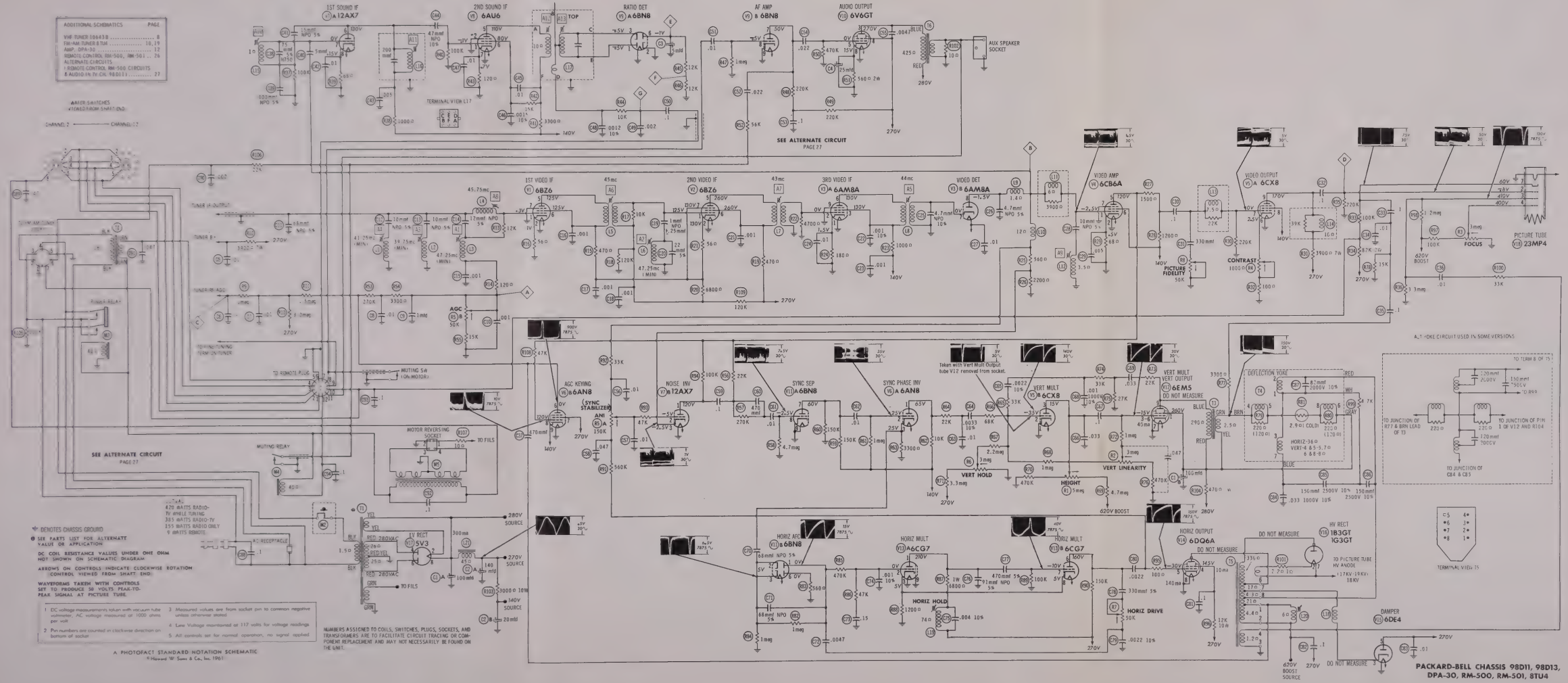
CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KC735


ADDITIONAL SCHEMATICS PAGE
VHF TUNER 10643B 8
FM-AM TUNER 8TU4 10,19
AMP. DPA-30 12
REMOTE CONTROL RM-500, RM-501 .. 26
ALTERNATE CIRCUITS
REMOTE CONTROL RM-500 CIRCUITS
& AUDIO IN TV CH. 98D11 27
1ST SOUND IF V1 A 12AX7
2ND SOUND IF V3 6AU6
RATIO DET V5 A 6BN8
AF AMP V9 B 6BN8
AUDIO OUTPUT V10 6V6GT
AUX SPEAKER SOCKET
SEE ALTERNATE CIRCUIT PAGE 27
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 A 6AM8A
VIDEO DET V3 B 6AM8A
VIDEO AMP V4 6CB6A
VIDEO OUTPUT V5 A 6CX8
PICTURE TUBE V18 23MP4
PICTURE FIDELITY 50K
CONTRAST 1000Ω
FOCUS
620V BOOST
AGC 50K
AGC KEYING V6 B 6AN8
(SYNC STABILIZER)
NOISE INV V7 A 12AX7
SYNC SEP V11 A 6BN8
SYNC PHASE INV V6 A 6AN8
VERT MULT V5 B 6CX8
VERT MULT VERT OUTPUT V12 6EM5
DO NOT MEASURE
VERT HOLD
VERT LINEARITY
HEIGHT
620V BOOST
DEFLECTION YOKE
HORIZ AFC V11 B 6BN8
HORIZ MULT V13 A 6CG7
HORIZ MULT V13 B 6CG7
HORIZ HOLD
HORIZ DRIVE 50K
HORIZ OUTPUT V14 6DQ6A
DO NOT MEASURE
HV RECT V16 1B3GT 1G3GT
TO PICTURE TUBE HV ANODE
+17KV-19KV= 18KV
DAMPER V15 6DE4
620V BOOST SOURCE
A.T.-K.E. CIRCUIT USED IN SOME VERSIONS
TERMINAL VIEW 15
TUNER A.G.C.
TUNER B+
TUNER R.F. AGC
TUNING TERM. ON TUNER
TO REMOTE PLUG
MUTING SW (ON MOTOR)
MUTING RELAY
MOTOR REVERSING SOCKET
TO FILS
AC RECEPTACLE
LV RECT V17 5V3
280V SOURCE
270V SOURCE
140V SOURCE
CHANNEL 2
CHANNEL 13
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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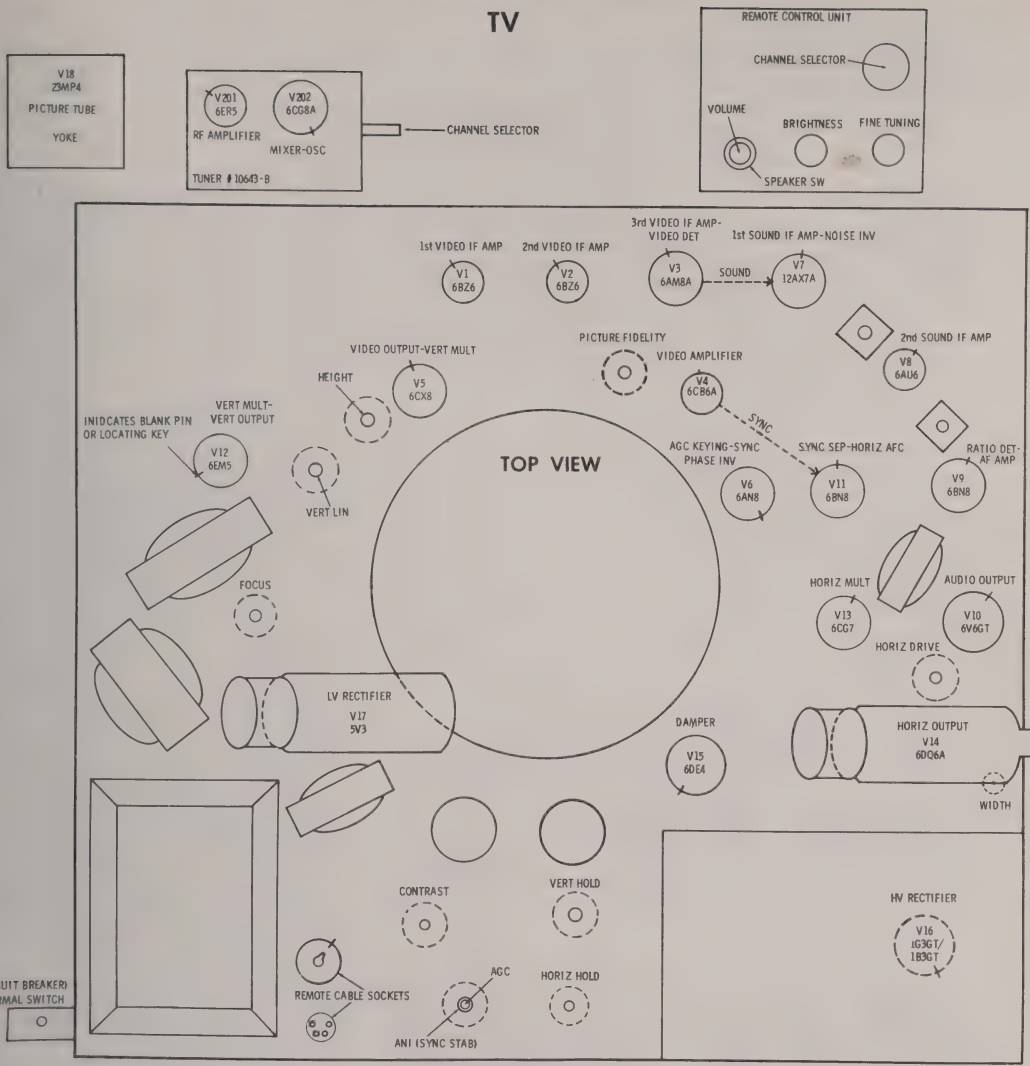
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
PACKARD-BELL CHASSIS 98D11, 98D13, DPA-30, RM-500, RM-501, 8TU4

TUBE PLACEMENT CHART
TV



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, V17

SWEEP FAILURE
No raster, has sound V13, V14, V15, V16, V18
No vertical deflection V5, V12
Poor vert. linearity or foldover V5, V12
Poor horiz. linearity or foldover V13, V14, V15
Narrow picture V13, V14, V15, V17
Vert. off freq. V5, V12
Horiz. off freq. V11, V13

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V18
Has pic, no sound V7, V8, V9, V10
Overloaded picture V6

SYNC FAILURE
No vert. sync V11, V6
No horiz. sync V11, V6
No vert. or horiz. sync V11, V6

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:
A1 thru A9, A11 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519
A10 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A13, A14 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
Mixer Plate Coil ... GENERAL CEMENT #9296. 9297
WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Remove Noise Inverter tube from its socket.
Connect the negative lead of a 6 volt bias supply to point (A). Positive to chassis.
The geneator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.		Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	47.25MC (Unmod)	Any non-interfering channel	DC probe thru 10K to point (B). Common to chassis. (Across Video Det. load)	A1, A2	Set generator output at maximum. Adjust for MINIMUM deflection.
2.		"	39.75MC	"	"	A3	"
3.		"	41.25MC	"	"	A4	"
4.		"	44.0MC	"	"	A5	Use only enough generator output to provide a usable indication on VTVM. Adjust for maximum deflection.
5.		"	45.0MC	"	"	A6	"
6.		"	43.0MC	"	"	A7	"
7.		"	45.75MC	"	"	A8	"
8.		"	45.0MC	"	"	Mixer Plate Coil	"

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect high side of a separate signal generator to ground lead of IF input cable to provide markers. DO NOT connect low side of generator.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	63MC (10MC Swp)	41.25MC 43.0MC 45.0MC 45.75MC 47.25MC	3	Vert. Amp. thru 22K to point (B). Low side to chassis. DC probe of VTVM to point (C). Common to chassis.		Adjust sweep output to develop -4 volts or less on AGC line as indicated by VTVM. Check for response curve similar to Fig. 1 with markers as shown. If necessary, retouch Mixer Plate Coil to position 45.75MC marker at 50%, A7 to position 43.0MC marker at corner of curve and A8 and A5 for correct tilt, dip or hump. A8 will affect higher frequency part and A5 the lower frequency. Replace the Noise Inverter tube in its socket.

4.5MC TRAP ALIGNMENT

Remove Video Detector tube from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to point (D). Common to chassis.	A9	Adjust for MINIMUM deflection. Replace Video Det. tube in its socket.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (E). Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
12.	"	"	"	"	DC probe to point (F). Common to point (G).	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

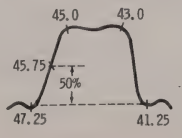
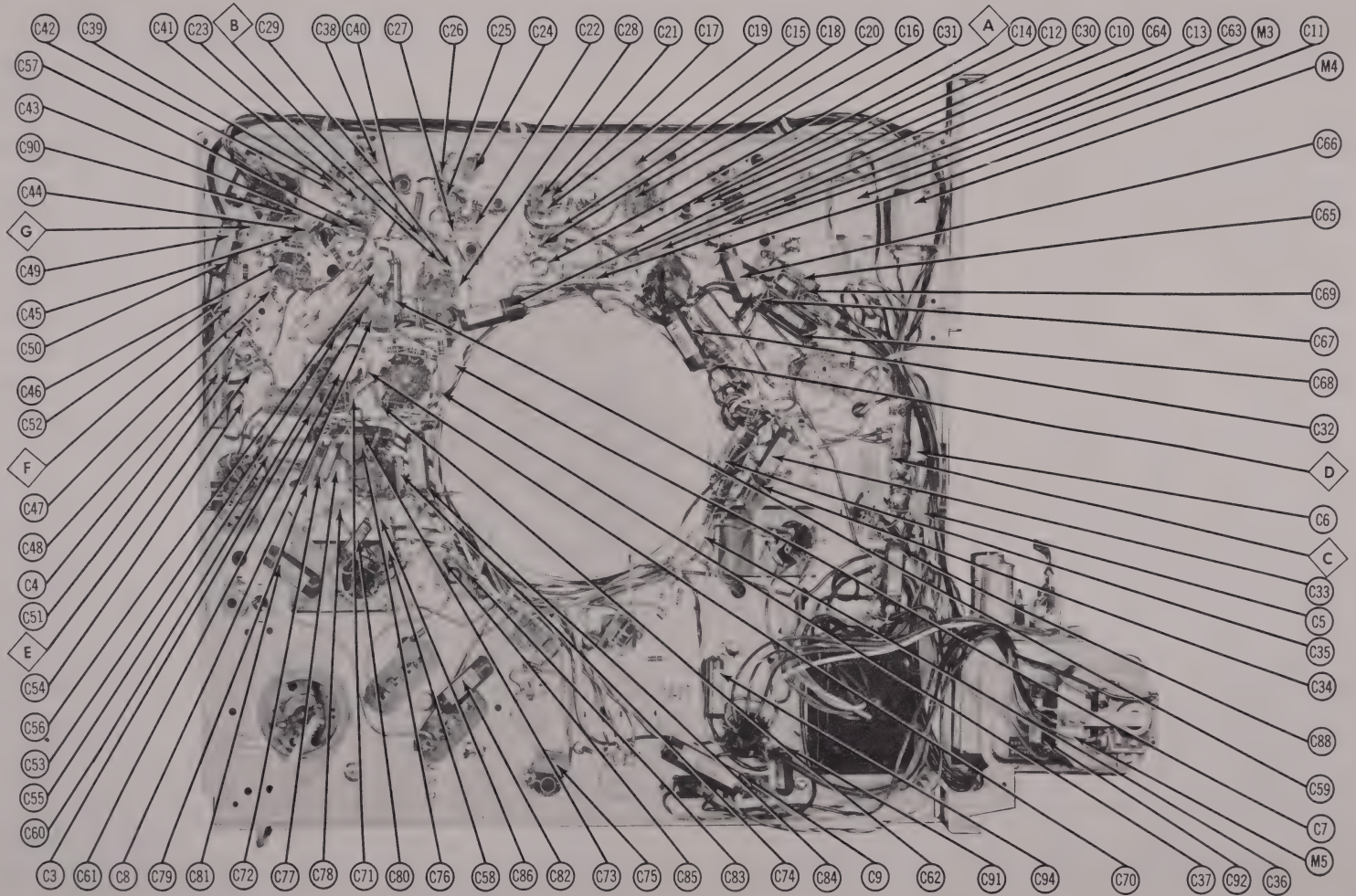
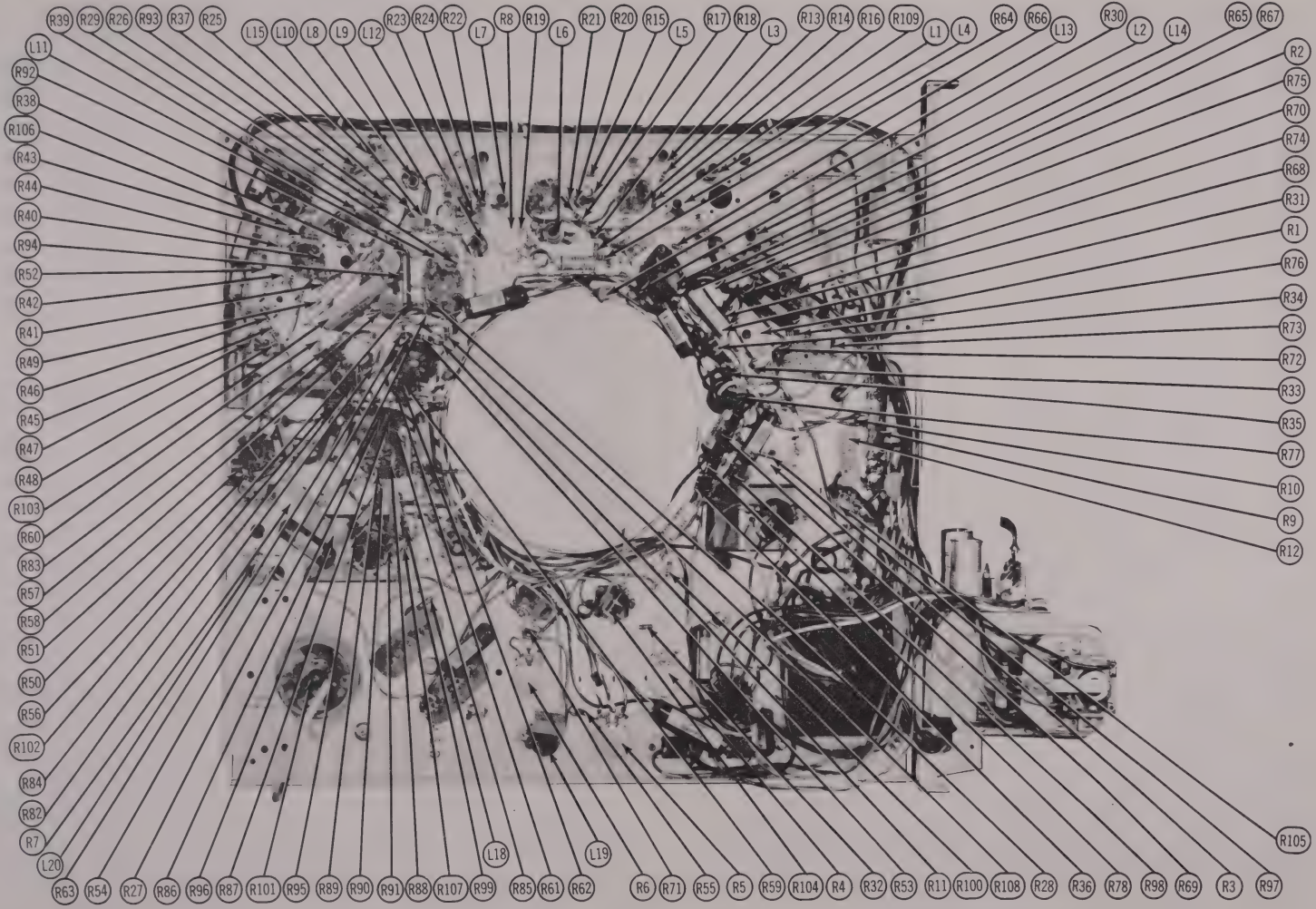


FIG. 1

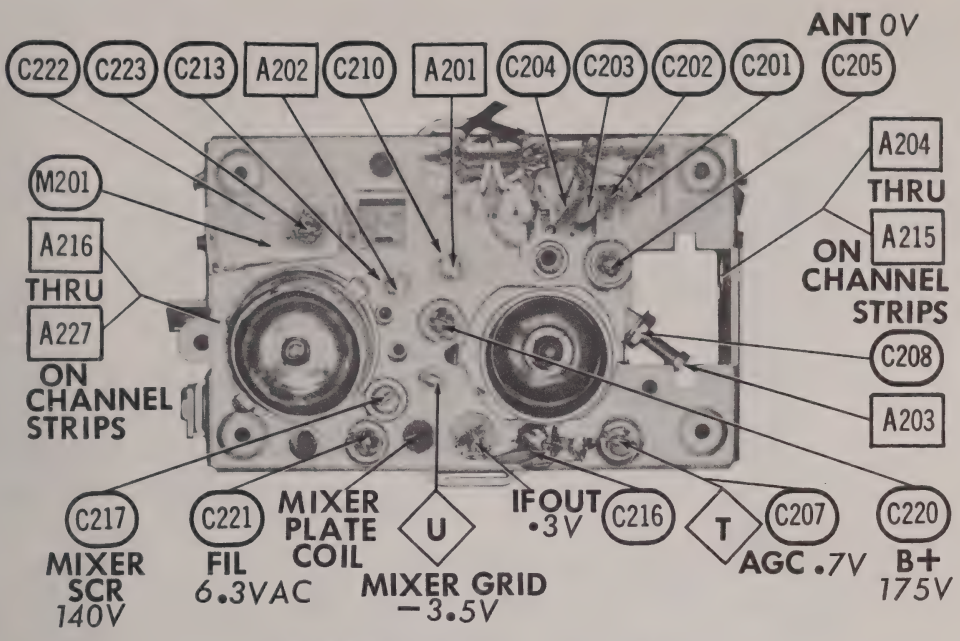
ALIGN. IDENTIFICATION PHOTOS - PAGE 5, 7



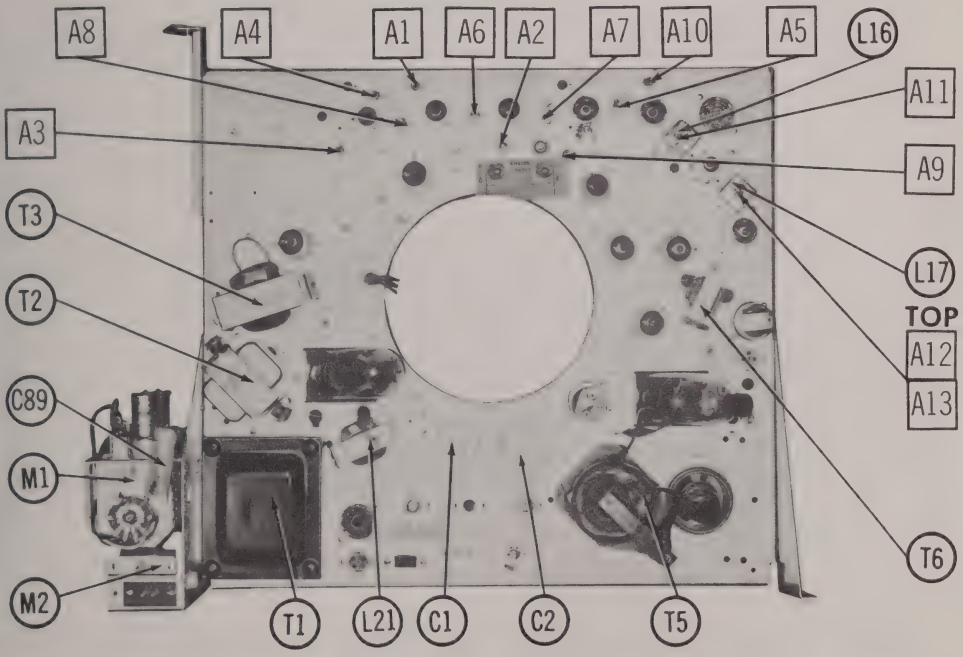
TV CHASSIS BOTTOM VIEW - ALIGN., CAPACITOR, MISC. IDENT.



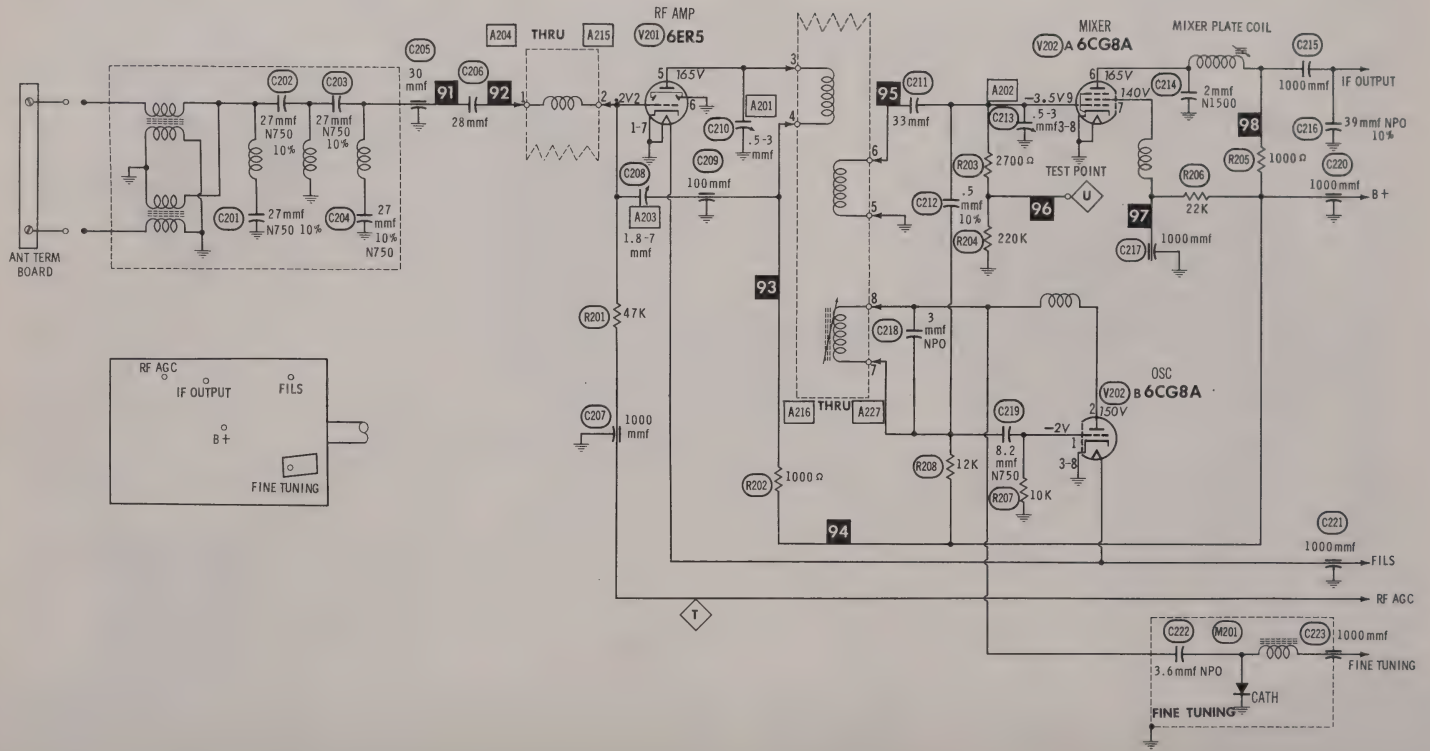
TV CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



VHF TUNER 10643B - TOP VIEW



TV CHASSIS - TOP VIEW



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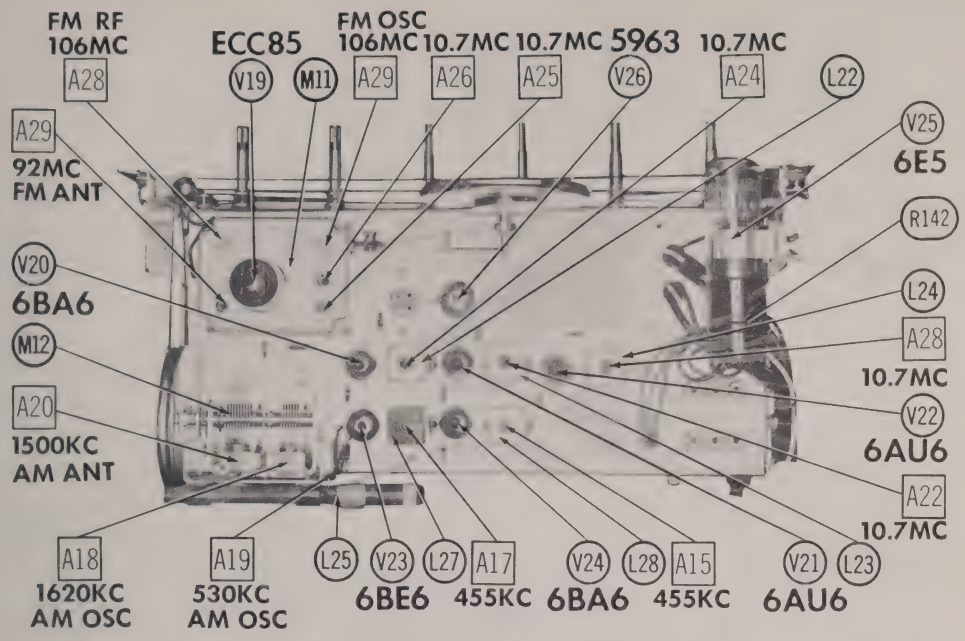
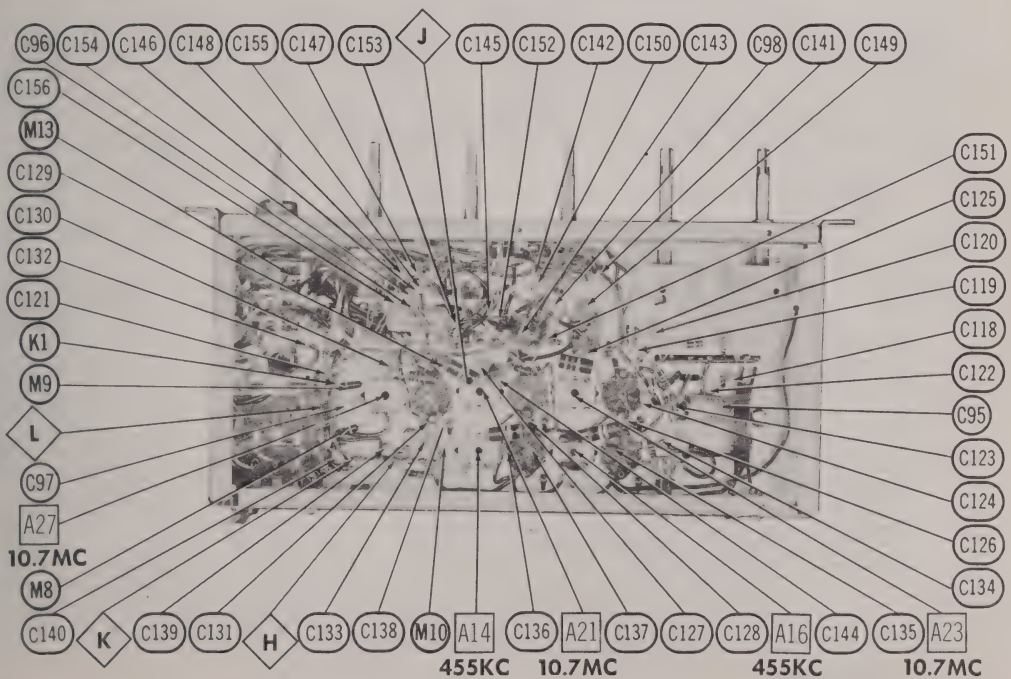
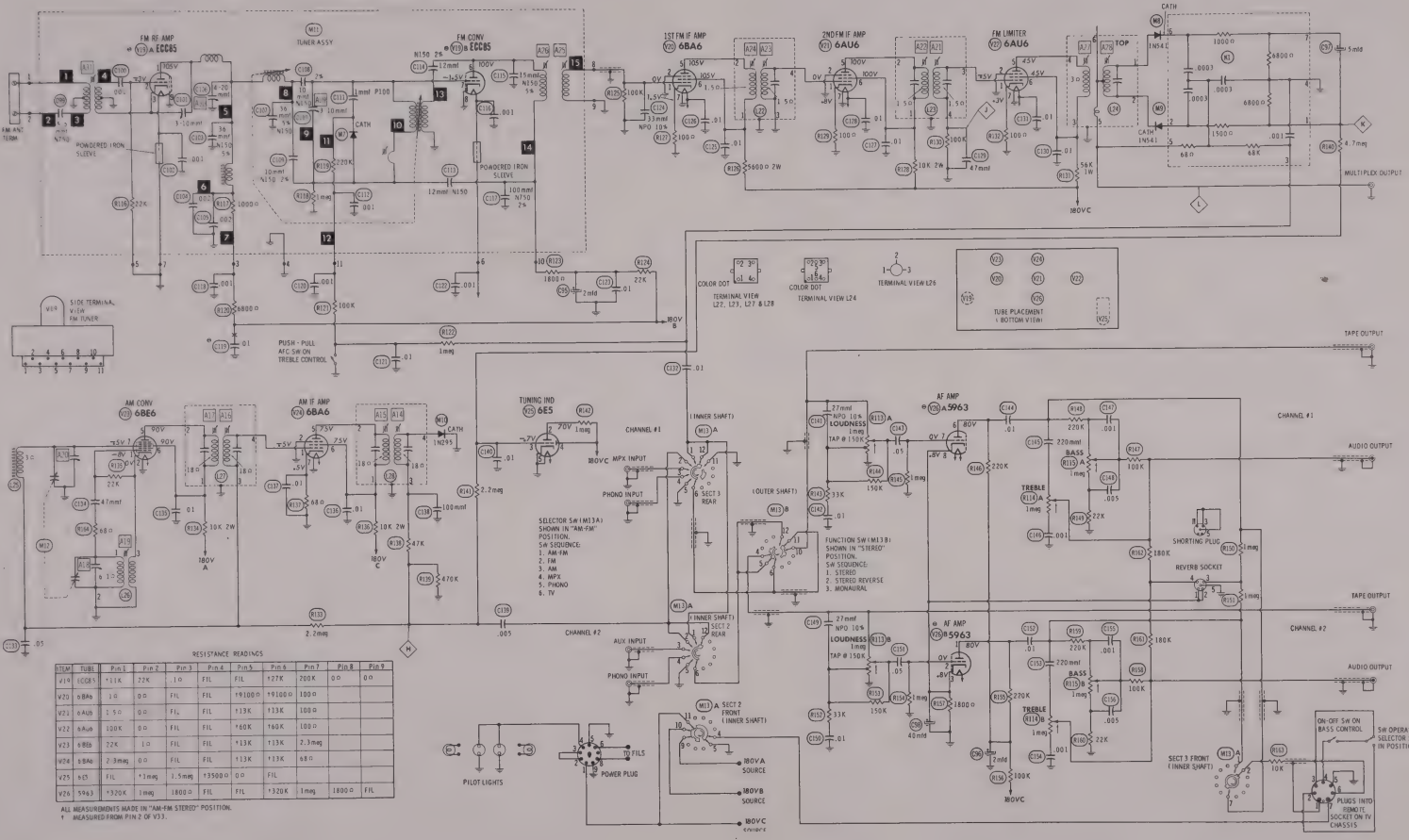
VHF TUNER 10643B



FM-AM TUNER 8TU4 - TOP VIEW



FM-AM TUNER BOTTOM VIEW - ALIGN., CAPACITOR, MISC. IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V19	ECC85	*11K	22K	.10	FIL	FIL	*27K	200K	0Ω	0Ω
V20	6BA6	10	0Ω	FIL	FIL	*91000Ω	*91000Ω	100Ω		
V21	6AU6	150	0Ω	FIL	FIL	*13K	*13K	100Ω		
V22	6AU6	100K	0Ω	FIL	FIL	*60K	*60K	100Ω		
V23	6BE6	22K	10	FIL	FIL	*13K	*13K	2.3meg		
V24	6BA6	2.3meg	0Ω	FIL	FIL	*13K	*13K	68Ω		
V25	6E5	FIL	*1meg	1.5meg	*3500Ω	0Ω	FIL			
V26	5963	*320K	1meg	1800Ω	FIL	FIL	*320K	1meg	1800Ω	FIL

ALL MEASURMENTS MADE IN "AM-FM STEREO" POSITION.
* MEASURED FROM PIN 2 OF V33.

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CIRCUITRAIL

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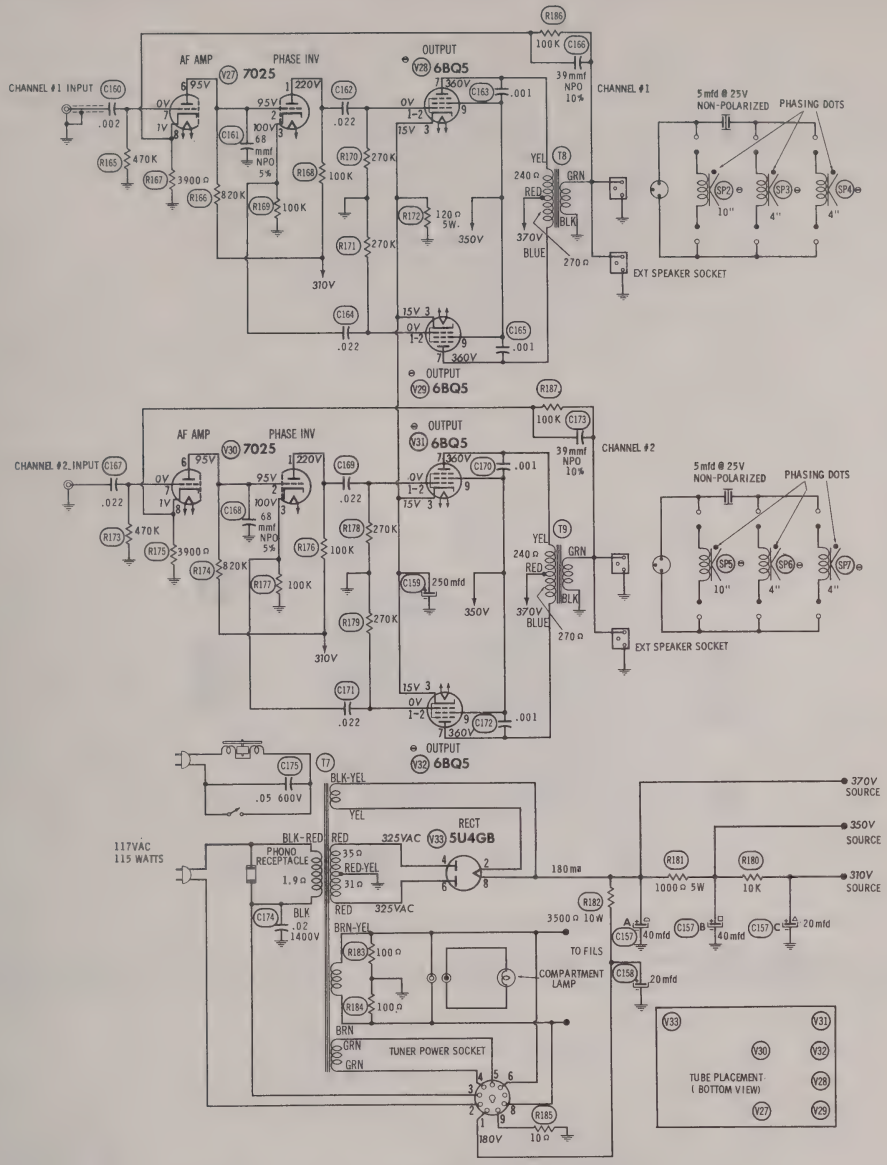
FM-AM TUNER 8TU4



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V27	7025	†110K	†830K	100K	FIL	FIL	†830K	470K	3900Ω	FIL
V28	6BQ5	NC	270K	120Ω	FIL	FIL	NC	†240Ω	NC	†1000Ω
V29	6BQ5	NC	270K	120Ω	FIL	FIL	NC	†270Ω	NC	†1000Ω
V30	7025	†110K	†830K	100K	FIL	FIL	†830K	470K	3900Ω	FIL
V31	6BQ5	NC	270K	120Ω	FIL	FIL	NC	†240Ω	NC	†1000Ω
V32	6BQ5	NC	270K	120Ω	FIL	FIL	NC	†270Ω	NC	†1000Ω
V33	5U4GB	NC	¶	NC	35Ω	NC	31Ω	NC	¶	

ALL MEASUREMENTS MADE IN "AM-FM STEREO" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V33. NC NO CONNECTION

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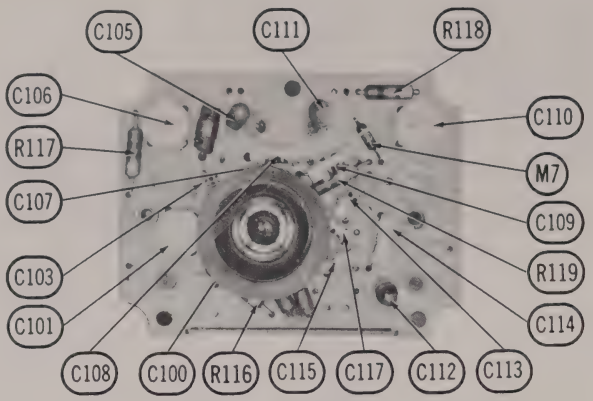
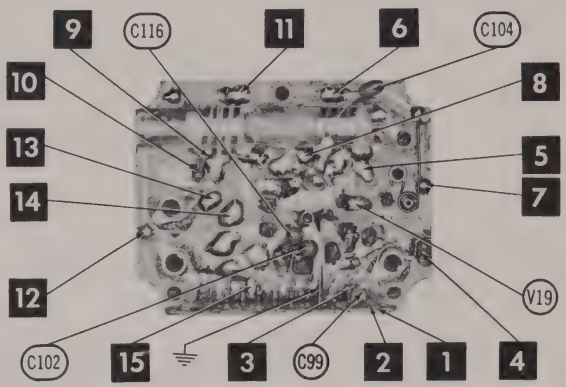
AMP DPA-30

SET 537 FOLDER 2





PRINTED BOARD

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FM RF SUBCHASSIS 10673

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

DESCRIPTION	PART NO.	MODEL NO. 23DD4	23DD6	23DK2
Safety Glass	55090	X	X	X
Mask	55154	X	X	X
Pointer-Radio Dial	67067			X
Pointer-Radio Dial	67068			X
Lens-Knob	55115			X
Dial-Radio	38198			X
Knob-Picture Fidelity	52183	X	X	X
Knob-Contrast, Vertical	52257			X
Knob-Contrast, Tone	52257	X	X	
Knob-	52220	X	X	

DESCRIPTION	PART NO.	MODEL NO. 23DD4	23DD6	23DK2
Knob-Radio Tuning (Outside)	52284			X
Knob-Radio Tuning (Inside)	52306			X
Knob- Function Selector Radio (Inside)	52277			X
Knob- Function Selector Radio (Outside)	52278			X
Knob-Bass, Treble, Loudness	52278			X
Knob-On-Off, AFC, Balance	52308			X
Cabinet	23DD4	X		
Cabinet	23DD6		X	
Cabinet	23DK2			X

REMOTE CONTROL RM-501 PARTS LIST

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R110A	Switch		25089					Power (Off-On), Speaker
B	50K	↓						Volume
R111A	50K	↓	25437	B-31	A47-50K-S	QU-133	U35	Brightness
B	Shaft			Not Req.	Not Req.	Not Req.	Not Req.	
R113	50K	↓	25628	B-32				Fine Tuning

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA Packard-Bell PART No.	QUAM PART No.
SP1	2½"	PM	3-4Ω	83136	25A07

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.
M8	Switch, Channel Selector	

FM–AM TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • USE	TYPE	ITEM No.	RAYTHEON • USE	TYPE	ITEM No.	SYLVANIA • USE	TYPE
V19	FM RF Amp. - FM Conv.	ECC85 (6AQ8) *	V24	AM IF Amp.	6BA6	V30	Channel 2 AF Amp. - Phase Inverter	7025
V20	1st FM IF Amp.	6BA6	V25	Tuning Indicator	6E5	V31	Channel 2 Output	6BQ5 (EL84) *
V21	2nd FM IF Amp.	6AU6	V26	Channel 1 AF Amp. - Phase Inverter	5963 (7025) *	V32	Channel 2 Output	6BQ5 (EL84) *
V22	FM Limiter	6AU6		Channel 2 AF Amp.		V33	Rectifier	5U4GB
V23	AM Converter	6BE6						

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C98	3	350	24166	PRS1705	BR345	TC596	TD-3-450	TVA-1701	
C98	3	350	24166	PRS1705	BR345	TC596	TD-3-450	TVA-1701	
C97	5	50	24194	PTT90	NLW5-50	TC30	MLV5-50	TE-1303	
C98	40	10	24151	PTT44	NLW40-10	MLV40-12	MLV40-12	TE-1119	

FIXED CAPACITORS

ITEM No.	RATING			REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C99	5.6	N750			BPD-001	DD-102	BYA10D1	CCD-102	B-210	6HK-D10
C100	.001									
C101	5-10				BPD-001	DD-102	BYA10D1	CCD-102	B-130	5HK-D10
C102	.001									10TCP-Q39
C103	36	N150	5%		BPD-002	DD-302	BYA10D3	CCD-302	B-320	5HK-D30
C104	.002				BPD-002	DD-302	BYA10D3	CCD-302	B-320	5HK-D30
C105	.002									
C106	4-20									10TCP-Q39
C107	36	N150	5%							10TCP-Q10
C108	10	N150	2%							10TCP-Q20
C109	10	N150	2%							
C110	3-10									
C111	1	P100								
C112	.001				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C113	12	N150								10TCP-Q12
C114	12	N150	2%							10TCP-Q12
C115	15	N150	5%							10TCP-Q25
C116	.001				BPD-001	DD-102	BYA10D1	CCD-103	B-210	5HK-D10
C117	100	N750	2%							
C118	.008				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C119	.01			Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C120	.001				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C121	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C122	.001				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C123	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C124	33	NPO	10%		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C125	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C126	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C127	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C128	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C129	47				DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C130	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C131	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C132	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C133	.05				BPD-05	DD-503	CUB325	4DP-3-503	GP150	5HK-S50
C134	47				DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C135	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C136	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C137	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C138	100				DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C139	.005				BPD-005	DD-503	BYA10D5	CCD-503	B-350	5HK-D50
C140	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C141	27	NPO	10%		NPO-DI 25	DTZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C142	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C143	.05				BPD-05	DD-503	CUB325	1DP-3-503	GP150	5HK-S50
C144	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C145	220				DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C146	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C147	.001				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C148	.005				BPD-005	DD-502	BYA10D5	CCD-502	B-350	5HK-D50
C149	27	NPO	10%		NPO-DI 25	DTZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C150	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C151	.05				BPD-05	DD-503	CUB325	1DP-3-503	GP150	5HK-S50
C152	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C153	220				DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C154	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C155	.001				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C158	.005				BPD-005	DD-502	BYA10D5	CCD-502	B-350	5HK-D50

Note 1. Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

TUNER PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R113A	1meg		25087					Loudness, Channel #1
B	1meg							Balance, Channel #2
R114A	1meg		25538B					Treble, Channel #1
B	1meg							Treble, Channel #2
C	Switch							AFC, Pull-Push, Off-On
R115A	1meg		25538B					Bass, Channel #1
B	1meg							Bass, Channel #2
C	Switch							Push-Pull, Off-On

① Tap ⑥ 150K.

▲ "STA-LOC" Equivalent: FR18T15, RU18T15, OB312, IS1937.
▲ "STA-LOC" Equivalent: FC16L, RUP16L1, OB312.

† "CONCENTRIKIT" Equivalent: K-4 Kit with Base Elements and Shafts: B18-137X, P10-U10 (Panel)
(Not available as a factory assembled unit.) B18-137X, RI-130 (Rear)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R116	22K			
R117	1000Ω			
R118	1meg			
R119	220K			
R120	68000Ω			
R121	100K			
R122	1meg			
R123	1800Ω			
R124	22K			
R125	100K			
R126	5600Ω 2W			
R127	100Ω			
R128	10K 2W			
R129	100Ω			
R130	100K			
R131	56K 1W			
R132	100Ω			
R133	2.2meg			
R134	10K 2W			
R135	22K			
R136	10K 2W			
R137	68Ω			
R138	47K			
R139	470K			
R140	4.7meg			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R141	2.2meg			
R142	1meg			
R143	33K			
R144	150K			
R145	1meg			
R146	220K			
R147	100K			
R148	220K			
R149	22K			
R150	1meg			
R151	1meg			
R152	33K			
R153	150K			
R154	1meg			
R155	220K			
R156	100K			
R157	1800Ω			
R158	100K			
R159	220K			
R160	22K			
R161	180K			
R162	180K			
R163	10K			
R164	68Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Packard-Bell PART No.	REPLACEMENT DATA
K1	Ratio Detector Network	.0003mfd, .0003mfd, .0003mfd, .001mfd, 68Ω, 1000Ω, 1500Ω, 6800Ω, 8800Ω, 68K	23627A	Aerovox PA-594 Centralab PC-342 Sprague C-42

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L22	2nd FM IF	29164	FM-254	1463	RTC-8590	7633	
L23	3rd FM IF	29167	FM-254	1463	RTC-8599	7633	
L24	Ratio Detector	29084	FM-255	1465	RTC-8600	7635	
L25	Loopstick		BC-419	705-A		7732	
L26	AM Osc.	29247	BC-393	Ti-OSC	RTC-8648	7510	
L27	1st AM IF	29077	BC-352	13-C1	RTC-8632	7607	
L28	2nd AM IF	29078	BC-353	13-C2	RTC-8633	7608	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Packard-Bell PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
MT	*					* AFC Diode
M8	1N541			1N541	1N541	Ratio Detector, Pigtail
M9	1N541			1N541	1N541	Ratio Detector, Pigtail
M10	1N295			1N295	1N295	AM Detector, Pigtail

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M11	FM Tuner	10673	Complete
M12	AM Tuning Cap.		2 Gang (Ant. 24-324mmf, Osc. 12-120mmf)
M13A	Switch		Function Selector (Rotary Wafer Type)
B	Switch		Mode (Rotary Wafer Type)

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY

ITEM No.	REPLACEMENT DATA Packard-Bell PART No. CARTRIDGE	Packard-Bell PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M14	63045	Not Req.	17D	Not Req.	26T	Not Req.	9TTS	N-9T-SD	

AMP PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • USE	TYPE	ITEM No.	RAYTHEON • USE	TYPE	ITEM No.	SYLVANIA • USE	TYPE
V27	Channel 1 AF Amp. - Phase Inverter	7025	V28	Channel 1 Output	6BQ5 (EL84) *	V29	Channel 1 Output	6BQ5 (EL84) *

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C157A	40	450	24147	AFE3-43-50	C0344	FP378.9	TMT-3745	TVL-3786	
B	40	450							
C	120	450							
C158	20	450	24001	PRS1735	BR3045	TC75	TD-20-450	TVA-1709	
C159	250	25	24144	PRS1280	BR2502	TC50025	TD-250-25	TVA-1208	

FIXED CAPACITORS

ITEM No.	RATING			REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C160	.022	400V			P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	47M-S22
C161	68	NPO	5%			DTZ-68	C10Q68C	CM-19B-680J	CNO-468	10TCC-Q68
C162	.022	400V			P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	47M-S22
C163	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C164	.022	400V			P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	47M-S22
C165	.001				BPD-001	DD-103	BYA10D1	CCD-103	B-210	5HK-D10
C166	39	NPO	10%		NPO-DI 39	DTZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C167	.022	400V			P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	47M-S22
C168	68	NPO	5%			DTZ-68	C10Q68C	CM-19B-680J	CNO-468	10TCC-Q68
C169	.022	400V			P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	47M-S22
C170	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C171	.022	400V			P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	47M-S22
C172	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C173	39	NPO	10%		NPO-DI 39	DTZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C174	.02	1400V				CUB1S22	16DP-4-203	GEM-1612	MB-S2	
C175	.05	600V			P651N-05	DD-503	BC584YJ	6DP-3-503	ACE-515	85Z-S47

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R165	470K			
R166	820K			
R167	39000Ω			
R168	100K			
R169	100K			
R170	270K			
R171	270K			
R172	120Ω 5W	PW5-120Ω	5W-8Q-120Ω	
R173	470K			
R174	820K			
R175	39000Ω			
R176	100K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R177	100K			
R178	270K			
R179	270K			
R180	10K			
R181	10000Ω 5W	PW5-1000	5W-8Q-1000	
R182	3500Ω 10W	PW10-3500	10W-8Q-3500	
R183	100Ω			
R184	100Ω			
R185	10Ω			
R186	100K			
R187	100K			

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T7	117V ① 1.4A	650VCT ② .180A DC	5V ③ 3A	89090					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V ④ 4A	6.3V ⑤ 2.7A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T8	9700Ω CT	6-8Ω	89460A	A-2901 ①	A-3870	22S88	S-55X	
T9	9700Ω CT	6-8Ω	89460A	A-2901 ①	A-3870	22S88	S-55X	

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA Packard-Bell PART No.	QUAM PART No.	NOTES
SP2	10"	PM	6-8Ω	83711 ①	10A6PA	① Used in Model 23DK2.
SP3	4"	PM	6-8Ω	83110 ①	4A1Z8	② Two may be used in some versions of Model 23DK2.
SP4	4"	PM	6-8Ω	83110 ①	4A1Z8	③ Two used in Models 23DD4, 23DD6.
SP5	10"	PM	6-8Ω	83711 ①	10A6PA	
SP6	4"	PM	6-8Ω	83110 ①	4A1Z6	
SP7	4"	PM	6-8Ω	83110 ①	4A1Z6	
	4"	PM	6-8Ω	83111 ②	4A0727.4	
	6" x 9"	PM	6-8Ω	83113 ③	6SA1Z6	

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC * USE	TYPE	ITEM No.	RAYTHEON * USE	TYPE	ITEM No.	SYLVANIA * USE	TYPE
V1	1st Video IF Amp.	6BZ6	V8	2nd Sound IF Amp.	6AU6			
V2	2nd Video IF Amp.	6BZ6	V9	Ratio Det. - AF Amp.	6BN6			
V3	3rd Video IF Amp. -		V10	Audio Output	6V6GT			
	Video Detector	6AM8A	V11	Sync Sep. - Horiz. AFC	6BN6			
V4	Video Amplifier	6CB6A	V12	Horiz. Mult. - Vert. Output	6EM5			
V5	Video Output - Vert. Mult.	6CX8	V13	Horiz. Mult.	6CG7			
V6	AGC Keying -		V14	Horiz. Output	6DQ6A			
V7	Sync Phase Inverter 1st Sound IF Amp. -	6AN8	V15	Damper	6DE4			
	Noise Inverter	12AX7A	V16	HV Rectifier	1G3GT/1B3GT			
			V17	LV Rectifier	5V3			

PICTURE TUBE

ITEM No.	REPLACEMENT DATA Packard-Bell PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V18	23MP4	23MP4 ①	23MP4 ②	23MP4 ③		① Aluminized ② Silver Screen "86"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	VOLT	REPLACEMENT DATA Packard-Bell PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	x100	350	24166	AFH32-41-50	AD5L2	FP150	TMS-1810	TVL-1750	
B	x100	350		BR10035	TC69	TD-100-450	TVA-1718	TVL-1750	
C2A	x140	350	24158	AFH32-41-80	FP238.3		TVA-1718	TVLS-2542 *	
B	x20	350							
C3	5	50	34038	PRS310	BRR5-50	TC50	TD-5-50	TVA-1303	
C4	25	25	34006	PRS260	BRR25-25	TC25	TD-25-25	TVA-1205	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	.1	200V		PSS8N-1	DF-104	CUB42P1	4DP-3-104	GEM-201	2TM-P10
C7	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	1.0	100V		PS88N-1.0	CUB2W1	1DP-5-105	GEM-Z	2TM-M1	
C10	.001			BPD-01	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	68	NPO	5%		DTZ-68	CHQ68C		CNC-468	10TCC-Q68
C12	10	NPO	5%	NPO-DI 10	DTZ-10	CHQ1C	CCTO-100	CNO-410	10TCC-Q10
C13	10	NPO	5%	NPO-DI 10	DTZ-10	CHQ1C	CCTO-100	CNO-410	10TCC-Q10
C14	13	NPO	5%	NPO-DI 10	DTZ-10	CHQ13C	CCTO-130	CNO-412	10TCC-Q13
C15	.001			BPD-001	DD-103	BYA10D1	CCD-102	B-210	5HK-D10
C16	.001			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	.001			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C18	.001			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C19	1	NPO	± .25 mmf	NPO-DI 1.0	DTZ-1			CNO-510	10TCC-V10
C20	25		5%	1469-000023	TCZ-23	[redacted]	CM-19B-220J	CNO-423	M3-423
C21	.001			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C22	.001		10%	DI-1000	DM15E		CCD-102	B-210	1DT5-D10
C23	.001			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C24	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	4.7	NPO	10%	NPO-DI 4.7	DTZ-4R7	CHQ47C	CCTO-4R7	CNO-547	10TCC-V47
C26	4.7	NPO	5%	NPO-DI 4.7	DTZ-4R7	CHQ47C	CCTO-4R7	CNO-547	10TCC-V47
C27	01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	10	NPO	5%	NPO-DI 10	DTZ-10	CHQ1C	CCTO-100	CNO-410	10TCC-V10
C29	.005			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C30	.1	600V		PS88N-1	DF-104	CUB42P1	4DP-3-104	GEM-601	2TM-P10
C31	330			DI-330	DD-331	LI0T33	CCD-331	B-333	1DT5-T33
C32	.1	600V		PS88N-1	DF-104	CUB42P1	4DP-3-104	GEM-601	2TM-P10
C33	.1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C34	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	.1	600V		PS88N-1	DF-104	CUB42P1	4DP-4-104	GEM-601	2TM-P10
C36	.01	600V		P688N-01	DS-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C37	470			DI-470	BYA10T47	CCD-471	B-347	10TS-T47	
C38	75	NT50	10%	NTQ-DI 75	DTN-75	CCTN-750	CNT-475	10TCC-Q75	
C39	100	NPO	5%	NPO-SI 100	TCZ-100	CIQ7SC		CNO-310	10TS-T10
C40	5			NPO-SI 5.0	DTZ-4R7	CHQ5C	CCTO-050	CNO-547	10TCC-V50
C41	15	NPO	5%		DTZ-15	CHQ15C	CCTO-150	CNO-415	10TCC-Q15
C42	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C43	.005			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C44	47	NPO	10%	NPO-DI 47	DTZ-47	CHQ47C	CCTO-470	CNO-447	10TCC-Q47
C45	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C46	.0068		10%	DI-1500	DM15T		CCD-152	GP25	1DT5-D15
C47	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C48	.0012		10%	DI-1200	DM5D		CCD-122	GP12	1DT5-D12
C49	.002			BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C50	.1	200V		PS88N-1	DF-104	CUB42P1	4DP-3-104	GEM-201	2TM-P10
C51	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C52	.022	400V		P488N-022	DD-303	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C53	.1	600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C54	.022	400V		P488N-022	DD-303	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C55	.0047	600V		P688N-0047	DE-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C56	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C57	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C58	.047	200V		P288N-047	DD-503	CUB3S47	4DP-3-473	GEM-4147	2TM-S47
C59	.1	200V		PS88N-1	DF-104	CUB42P1	4DP-3-104	GEM-201	2TM-P10
C60	470			DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C61	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C62	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C63	.01	600V		P688N-01	DS-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C64	.0033	600V	10%	V34CD332-10%		[redacted]	6DP-1-222	GEM-6222	6TM-D22
C65	.0033	400V	10%	V34CD332-10%		[redacted]	6DP-1-222	GEM-6222	6TM-D22
C66	.033	600V		P688N-033	DD-303	CUB6S33	6DP-2-333	GEM-6133	6TM-S33
C67	.1	600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C68	.001	1000V	10%	P1084CM-001J	DD-102	[redacted]	1GDP-2-102	GEM-1632	10TM-D10
C69	.033	600V		P688N-033	DD-303	CUB6S33	6DP-2-333	GEM-6133	6TM-S33
C70	68	NPO	5%		DTZ-68	CHQ68C	CM-19B-680J	CNO-468	10TCC-Q68
C71	68	NPO	5%		DTZ-68	CHQ68C	CM-19B-680J	CNO-468	10TCC-Q68
C72	.0047	600V		P688N-0047	DE-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C73	.15	200V		PS88N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15
C74	.001	600V	10%	V34CS2E-10%		PM5DI	6DP-1-102	GEM-1632	6TM-D10
C75	.094		10%	1464-004		[redacted]	TM-20B-403K	MCE463	M3-394
C76	01	NPO	5%		TCZ-91	CIQ9SC	CM-19B-910J		M3-491

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C77	470		5%	1469-00047		SR5T47	CM-19B-47IJ	MCJ344	M3-347
C78	330		5%	1469-00033		SR5T33	CM-19B-33IJ		M3-333
C79	.0022	400V	10%	V34CS22-10%		PM5D22	6DP-1-222	GEM-16222	6TM-D22
C80	.0022	600V		P688N-0022	DE-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C81	.1	600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C82	.1	600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C83	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C84	.033	1000V	10%	P1084CM-033J		DPMB3S33	1GDP-5-333	GEM-1633	10TM-S33
C85	150	2500V	10%				VCM-20-151K		
C86	150	2500V	10%				VCM-20-151K		
C87	82	2000V	10%			HVA30Q82	VCM-20-820K	3DY-482	
C88	.1	600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C89	.47	200V		P288N-47		CUB2P47	2DP-3-474	GEM-2047	2TM-P47
C90	.0022			BPD-002	DD-302	BYA10D2	CCD-203	B-230	5HK-D20
C91	.047	200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C92	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C93	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C94	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10

CONTROLS

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS - IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	5meg	½	25910	TT-57	B47-5meg-S	RLC-5	PTA56L	Height
R2	1meg	½	25967	BX-84	B47-1meg-S	RLC-3	SU-59	Vert. Linearity
R3	3meg	½	25867	BX-84	B47-3meg-S	RLC-3	SU-59	Focus
R4A	1000Ω	½	25904A	B-505	A47-1000-S	QIT-108	U3	Contrast
B	Shaft			Not Req.	FK3-1/4	Not Req.	Not Req.	
R5A	150K	½	25968	FI-32		QU-981	U3912	ANT (Sync Stability)
B	50K	½		H3-29		QU-981		AGC
R6A	3meg	½	25984	B-84	A47-3meg-S	QU-140	U59	Vert. Hold
B	Shaft			Not Req.	FK3-1/2	Not Req.	Not Req.	
R7A	50K	½	25908	BX-31	B47-50K-S	BU-123	PTA54L	Horiz. Drive
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R8A	50K	½	25946	B-32	A47-50K-Z	QU3-123	U33	Pic. Fidelity
B	Shaft			Not Req.	K28-3	Not Req.	Not Req.	

■ "STA-LOC" Equivalent: FB154L, RU54L, C6500, 18437.

† "CONCENTRIKIT" Equivalent: K-8 Kit with Base Elements and Shafts: B11-325, P19-012 (Panel)
(Not available as a factory assembled unit.) B11-123, R15-005 (Rear)
R5 (Bushing)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R9	1meg			
R10	8.2meg			
R11	1.5meg			
R12	3900Ω 7W	PW10-3900	10W-8Q-3900	
R13	12K			
R14	120Ω			
R15	470Ω			
R16	56Ω			
R17	10K			
R18	120K			
R19	470Ω			
R20	180Ω			
R21	55Ω			
R22	4700Ω			
R23	1000Ω			
R24	180Ω			
R25	560Ω			
R26	2200Ω			
R27	1500Ω			
R28	1200Ω			
R29	68Ω			
R30	220K			
R31	3900Ω 7W	PW10-3900	10W-8Q-3900	
R32	100Ω			
R33	56K			
R34	82K 2W			
R35	220K			
R36	5.5meg			
R37	100K			
R38	1000Ω			
R39	68Ω			
R40	100K			
R41	3300Ω			
R42	15K			
R43	120Ω			
R44	10K			
R45	12K			
R46	12K			
R47	1meg			
R48	220K			
R49	220K			
R50	470K			
R51	560Ω 2W			
R52	56K			
R53	270K			
R54	3300Ω			
R55	15K			
R56	22K			
R57	270K			
R58	4.7meg			
R59	150K			

* Alternate Value.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R60	150K			
R61	1meg			
R62	10K			
R63	3300Ω			
R64	22K			
R65	33K			
R66	68K			
R67	2.2meg			
R68	1meg			
R69	4.7meg			
R70	470K			
R71	3.3meg			
R72	1meg			
R73	22K			
R74	33K			
R75	27K			
R76	470K			
R77	3300Ω			
R78	15K			
R79	220Ω			
R80	220Ω			
R81	2.5Ω (Cold)			
R82	1meg			
R83	560Ω			
R84	1meg			
R85	470K			
R86	47K			
R87	6800Ω 1W			
R88	1200Ω			
R89	100K			
R90	150K			
R91	560K			
R92	33K			
R93	47K			
R94	100K			
R95	100Ω			
R96	12K 10W	PW10-12K	10W-8Q-12K	
R97	100K			
R98	1.2meg			
R99	4700Ω			
R100	33K			
R101	2.2Ω 1W			
R102	10Ω			
R103	3000Ω 10W	PW10-3000	10W-8Q-3000	
R104	470Ω 2W			
R105	100K			
R106	22K			
R107	10Ω			
R108	47K			
R109	120K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	41.25 MC Trap	29760	TV-152	6225	RTC-8556	TZ8	
L2	39.75 MC Trap	29760	TV-152	6225	RTC-8556	TZ8	
L3	47.25 MC Trap	29759	TV-153	6225	RTC-8556	TZ8	

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L4	1st Video IF	29755	TV-131	6225	RTC-8556	TZ8	
L5	2nd Video IF	29565	TV-130	6219	RTC-8551	TZ7	
L6	47.25MC Trap	29564	TV-153	6235	RTC-8556	TZ8	
L7	3rd Video IF	29565	TV-130	6235	RTC-8551	TZ7	
L8	4th Video IF	29585	TV-130	6219	RTC-8551	TZ7	
L9	RF Choke (10uh)		DC-586	4612	RTC-8523	T960	① Wound on 3900Ω Resistor. ② Wound on 22K Resistor. ③ Wound on 39K Resistor.
L10	Peaking (250uh)		TV-186	4581	RTC-8598	T705	
L11	Peaking (93uh) ①		TV-181 †	6177 †	RTC-8594 †	T704 †	†Parallel with 3900Ω Resistor
L12	4.5MC Trap	29548	TV-181	1470	RTC-8603	T754	
L13	Peaking (12uh) ②		TV-183	6178	RTC-8595	T706	
L14	Peaking (180uh) ③		TV-183	6179	RTC-8596	T709	
L15	1st Sound IF	29053C	TV-151	1469	RTC-8602	T749	
L16	2nd Sound IF	29578A	TV-151	1469	RTC-8602	T749	
L17	Ratio Detector	29694	TV-123-B	1486 RD	RTC-8060	T257	
L18	RF Choke (10uh)		DC-586	4623	RTC-8523	T961	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.
L19	Horiz. Stabilizer	29703	TV-163	6211	RC11G	RTC-8623	HS-7	WLC-25	T103
L20	Width Coil	29716	MWC-11	6239 ①	QRC-409 ②	WC-11 ③	WC-28 ③	WLC-6	T118

① Do not use Tsp. ② Drill new mounting hole(s). ③ Use Black and White Terminals.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ^)	REPLACEMENT DATA Packard-Bell PART No	Merit	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
L21	.240A	45Ω	.7 Hy.	27006F		C-2343	26C44	C-34X	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA Packard-Bell PART No	Merit	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T1	117V ② 1.9A	560VCT 5V ④ 300A DC	5V ④ 3.8A	89076	P-3055	P-8167 ①	26S192	R-42BC ③	① Phase & parallel 5.5A & 6.5A (6.3V windings). ③ Phase & parallel 5A & 5A (6.3V windings).
	SEC. 3	SEC. 4	SEC. 5						
	6.3V ③ 10A								

TRANSFORMER (MOTOR)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA Packard-Bell PART No	Merit	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T2	117V ② .2A	24V ② 2A AC		89060B			23T52 ①		① Drill new mounting hole(s).

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	Vert. Output	89501			VO-101	26S14	A-113X	
T4	Yoke (Horiz.18.2MH) (Vert. 19mH - 113Ω) Rear Cover and Centering Device	29758		PCM-2017 ① ②	DY-27A ②	Y-52 ②	Y-60-1	
	Yoke Clamp	34103						
T5	Horiz. Output	28258 89527						(120Ω) * (120Ω) *

① Removes horizontal damping network. Use original. ② Use original rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T6	4000Ω	3-4Ω	89436F	A-2930	A-3877	24S05	S-41X	

MISCELLANEOUS

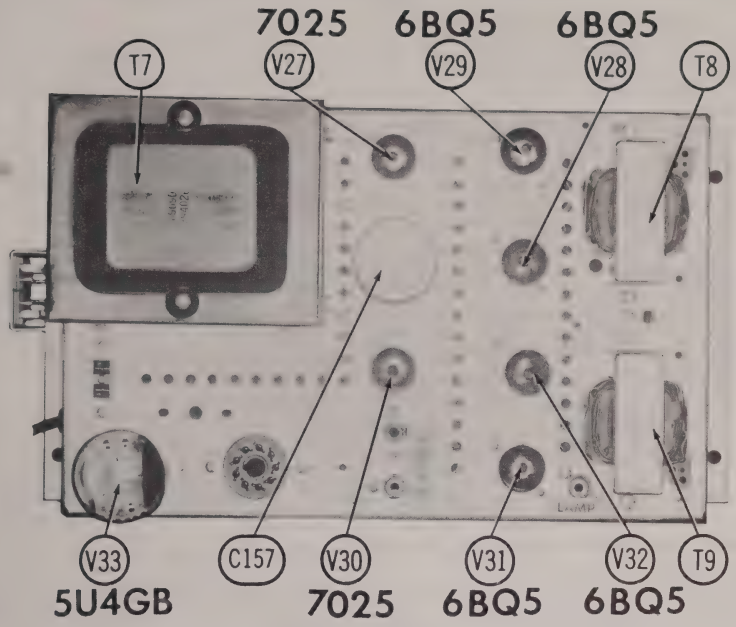
ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M1	Tuner	10643-B	VHF
M2	Circuit Breaker		
M3	Relay		Power
M4	Relay		Muting
M5	Motor		Includes Muting Switch, Channel Selector Switch

WIRING DATA

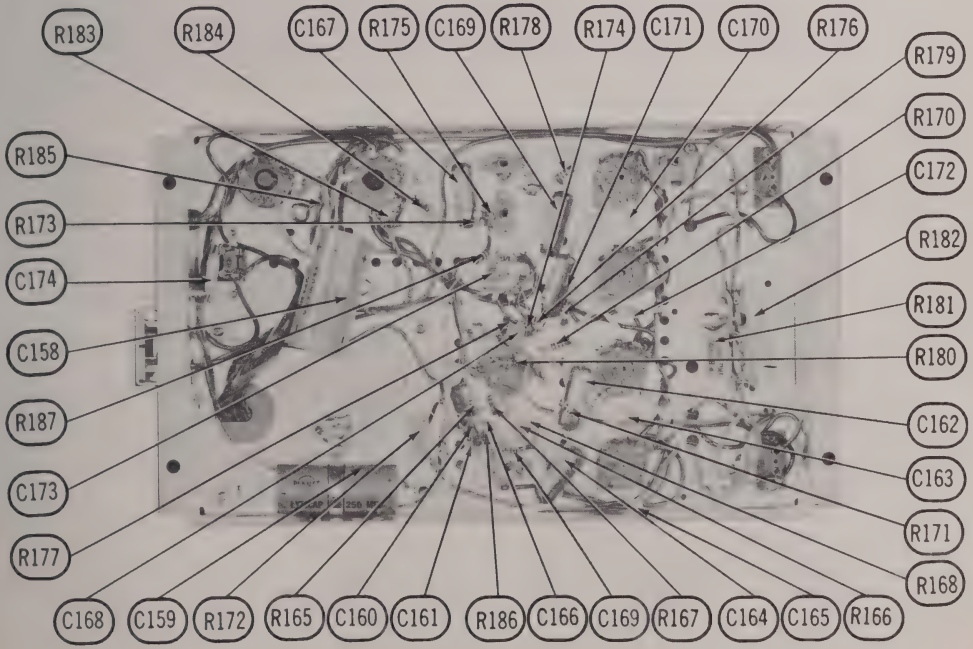
High Voltage Lead	Use BELDEN No. 8889
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor

PACKARD-BELL CHASSIS 98D11, 98D13, DPA-30, RM-500, RM-501, 8TU4

FOLDER 2



AMP DPA-30 - TOP VIEW



AMP DPA-30 - BOTTOM VIEW

AM-FM TUNER ALIGNMENT INSTRUCTIONS

8TU4

AM ALIGNMENT - SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of AM converter Low side to chassis.	455KC (400∿ Mod)	(AM) Tuning gang fully open	DC probe to point (H). Common to chassis.	A14, A15, A16, A17	Adjust for maximum deflection.
2.	Loop	1620KC	"	"	A18	"
3.	"	530KC	Tuning gang fully closed	"	A19	Adjust for maximum deflection. Repeat steps 2 and 3.
4.	"	1500KC	Tune to 1500KC signal	"	A20	Adjust for maximum deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM - SELECTOR IN FM POSITION

AFC switch pulled out to "OFF" position.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod)	FM Point of non-interference	DC probe to point (J). Common to chassis.	A21, A22, A23, A24, A25, A26	Adjust for maximum deflection.
6.	"	"	"	DC probe to point (K). Common to chassis.	A27	"
7.	"	"	"	DC probe to point (L). Common to chassis.	A28	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE- SELECTOR IN FM POSITION

AFC switch pulled out to "OFF" position.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	FM Point of non-interference	Vert. Amp. to point (J). Low side to chassis.	A21, A22, A23, A24, A25, A26	Adjust for maximum gain and symmetry of response similar to Fig. 2.
6.	"	"	"	Vert. Amp. to point (K). Low side to chassis.	A27	Disconnect Stabilizing Capacitor. Adjust for maximum gain and symmetry of response similar to Fig. 2.
7.	"	"	"	Vert. Amp. to point (L). Low side to chassis.	A28	Adjust to place marker at the center of cross-over lines similar to Fig. 3. SLIGHTLY retouch A20 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT - SELECTOR IN FM POSITION

AFC switch pulled out to "OFF" position.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals with 150Ω in each lead.	106MC (Unmod)	FM 106MC	DC probe to point (J). Common to chassis.	A29, A30	Adjust for maximum deflection.
9.	"	92MC	92MC	"	A31	Adjust for maximum deflection

FIG. 2

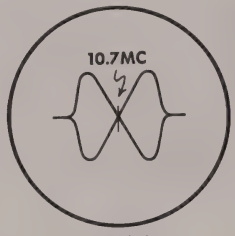
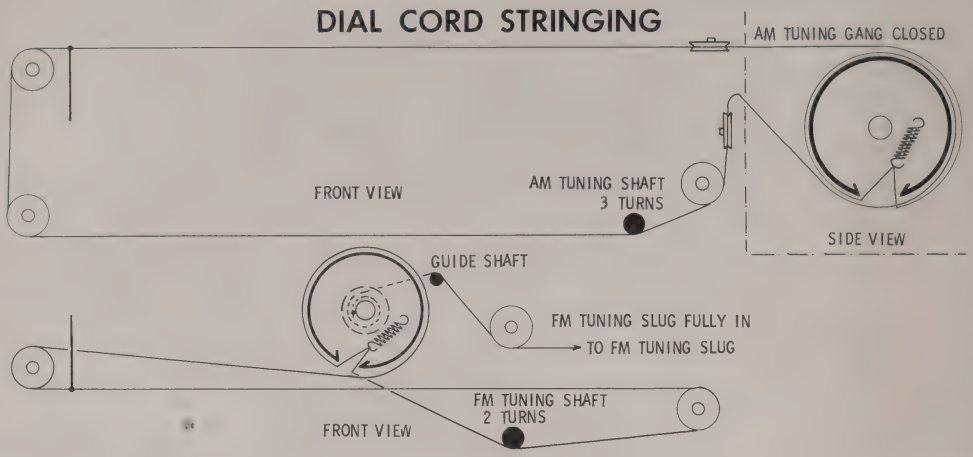
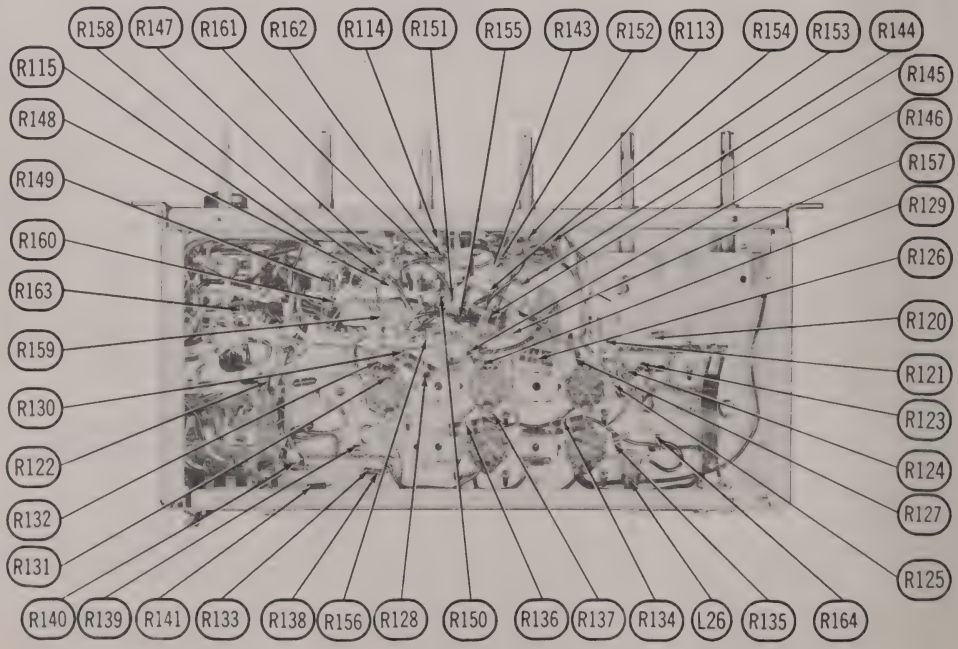


FIG. 3



FM-AM TUNER 8TU4 - DRIVE CORD STRINGING



FM-AM TUNER 8TU4 BOTTOM VIEW - RESISTOR IDENT.

VHF TUNER PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6ER5	V202	Mixer - Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C204	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C205	30							
C206	28		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	1.8-7			829-7				
C209	100		EF-0001	MFT-100				
C210	.5-3			829-3		CV-1	CT565	
C211	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-V33
C212	.5 10%		NPO-SI .5	TCZ-4R7				
C213	.5-3			829-3		CV-1	CT565	
C214	2 N1500							
C215	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C216	39 NPO 10%		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	3.0 NPO		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C219	8.2 N750				C10V82U			
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	
C221	1000		EF-001	MFT-1000		CCF-102	CT280A	
C222	3.6 NPO		NPO-DI 3.3	DTZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C223	1000		EF-001	MFT-1000		CCF-102	CT280A	

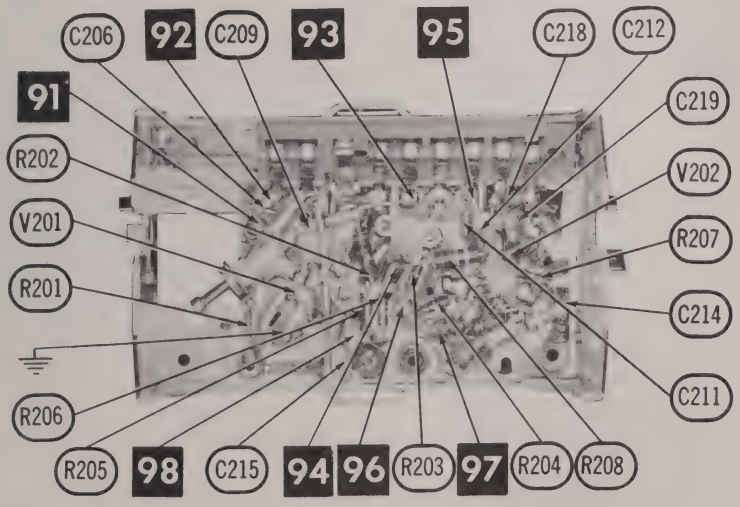
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R205	1000Ω			
R202	1000Ω				R206	22K			
R203	2700Ω				R207	10K			
R204	220K				R208	12K			

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M201	Fine Tuning Assy		



A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER 10643B — BOTTOM VIEW

TUNER ALIGNMENT INSTRUCTIONS

10643B

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A216 thru A227 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect the negative lead of a 4.5 volts bias supply to point ⓓ. Positive to chassis.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.		Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point ⓓ. Low side to chassis.	A201 A202 A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.		"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

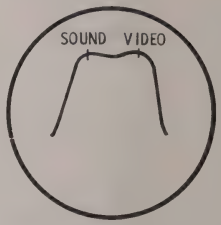


FIG. 201

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.		Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det.-load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

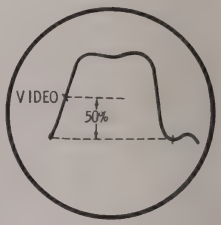
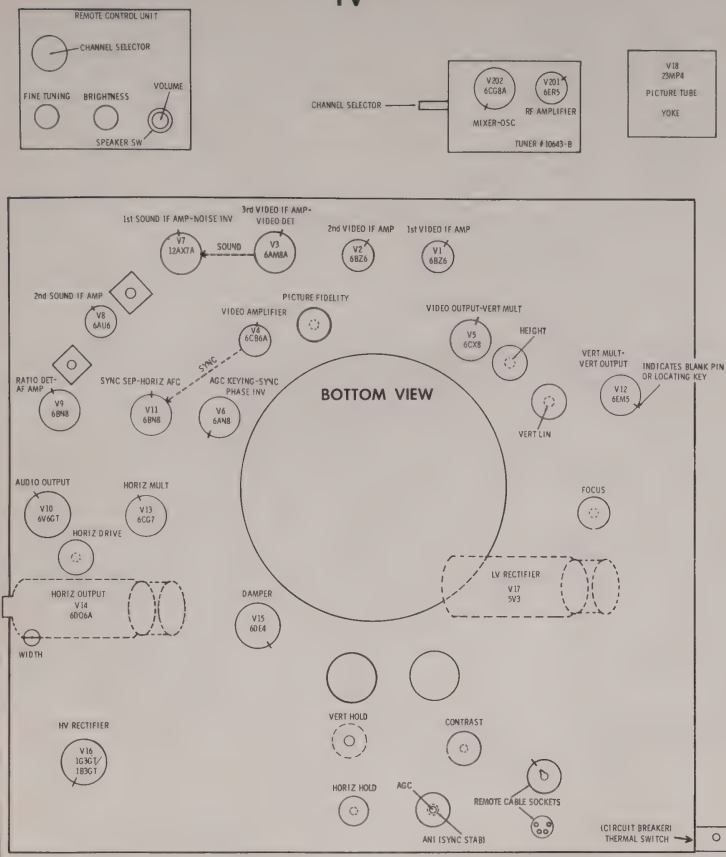


FIG. 202

TUBE PLACEMENT CHART

TV

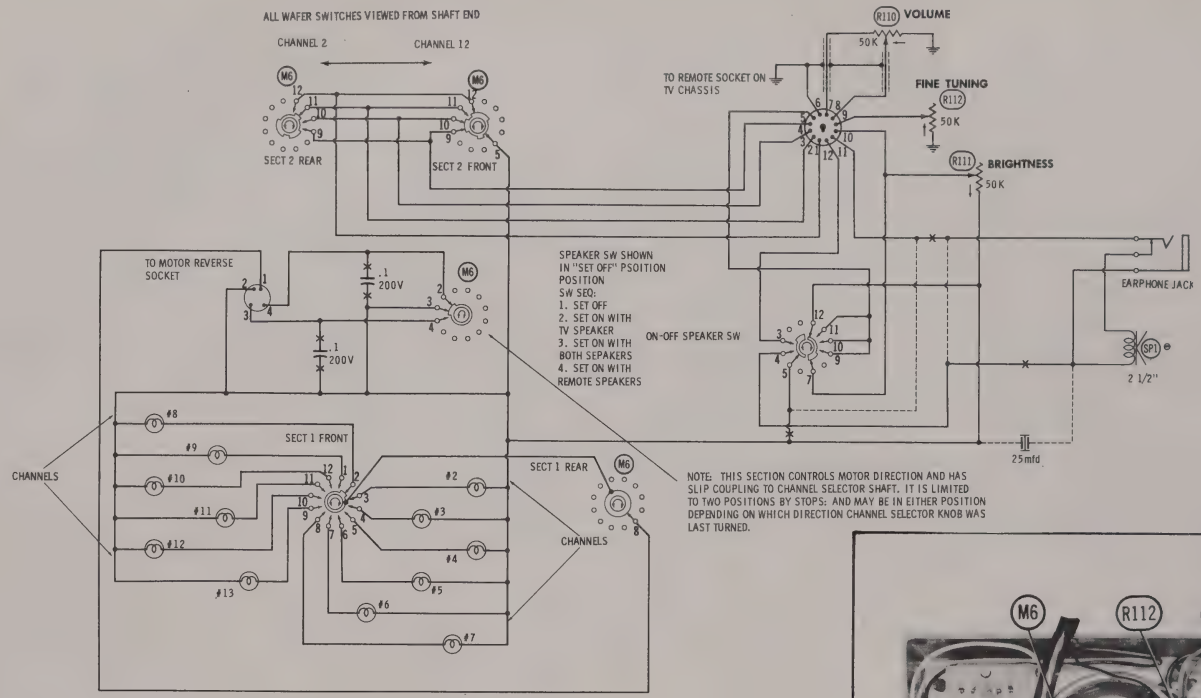


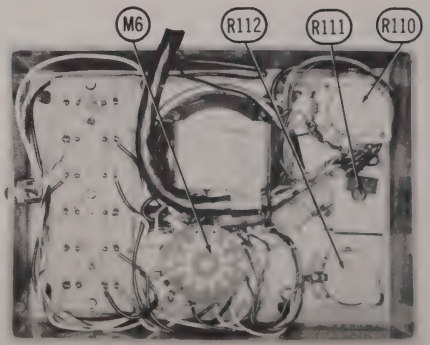
TV RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	•55K	56Ω	FIL	FIL	†70K	†70K	0Ω		
V2	6BZ6	60K	60K	FIL	FIL	†515Ω	†515Ω	60K		
V3	6AM8A	180Ω	.1Ω	†4000Ω	FIL	FIL	†4000Ω	.1Ω	2800Ω	0Ω
V4	6CB6A	2800Ω	68Ω	FIL	FIL	†5700Ω	†3000Ω	0Ω		
V5	6CX8	0Ω	•2meg	•†2meg	FIL	FIL	•150Ω	220K	†3000Ω	†3900Ω
V6	6AN8	†13K	1meg	3300Ω	FIL	FIL	•310K	†45Ω	†54K	†3000Ω
V7	12AX7A	†100K	•100K	2200Ω	FIL	FIL	†4000Ω	100K	68Ω	FIL
V8	6AU6	100K	0Ω	FIL	FIL	†6300Ω	†21K	120Ω		
V9	6BN8	INF	0Ω	INF	FIL	FIL	24K	†440K	1meg	0Ω
V10	6V6GT	NC	FIL	†425Ω	†45Ω	470K	TP	FIL	560Ω	
V11	6BN8	2meg	1meg	1meg	FIL	FIL	560Ω	†90K	4.7meg	0Ω
V12	6EM5	†470K	NC	NC	FIL	FIL	•2.5meg	0Ω	NC	†760Ω
V13	6CG7	†6800Ω	2.5meg	1200Ω	FIL	FIL	†150K	100K	1200Ω	0Ω
V14	6DQ6A	TP	FIL	NC	†12K	750K	TP	FIL	0Ω	TOP CAP †18Ω
V15	6DE4	NC	TP	1.5meg	NC	†45Ω	NC	FIL	FIL	
V16	1G3GT 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †350Ω
V17	5V3	NC	¶40K	NC	26Ω	NC	25Ω	NC	¶40K	
V18	23MP4	FIL	220K	†1meg	•†1.1meg	NC	NC	•110K	FIL	
V201	6ER5	0Ω	2.2meg	FIL	FIL	†4900Ω	0Ω	0Ω		
V202	6CG8A	10K	†16K	0Ω	FIL	FIL	†4900Ω	†26K	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 8 OF V17.
‡ MEASURED FROM PIN 3 OF V15.

NC NO CONNECTION
TP TIE POINT





RM-501

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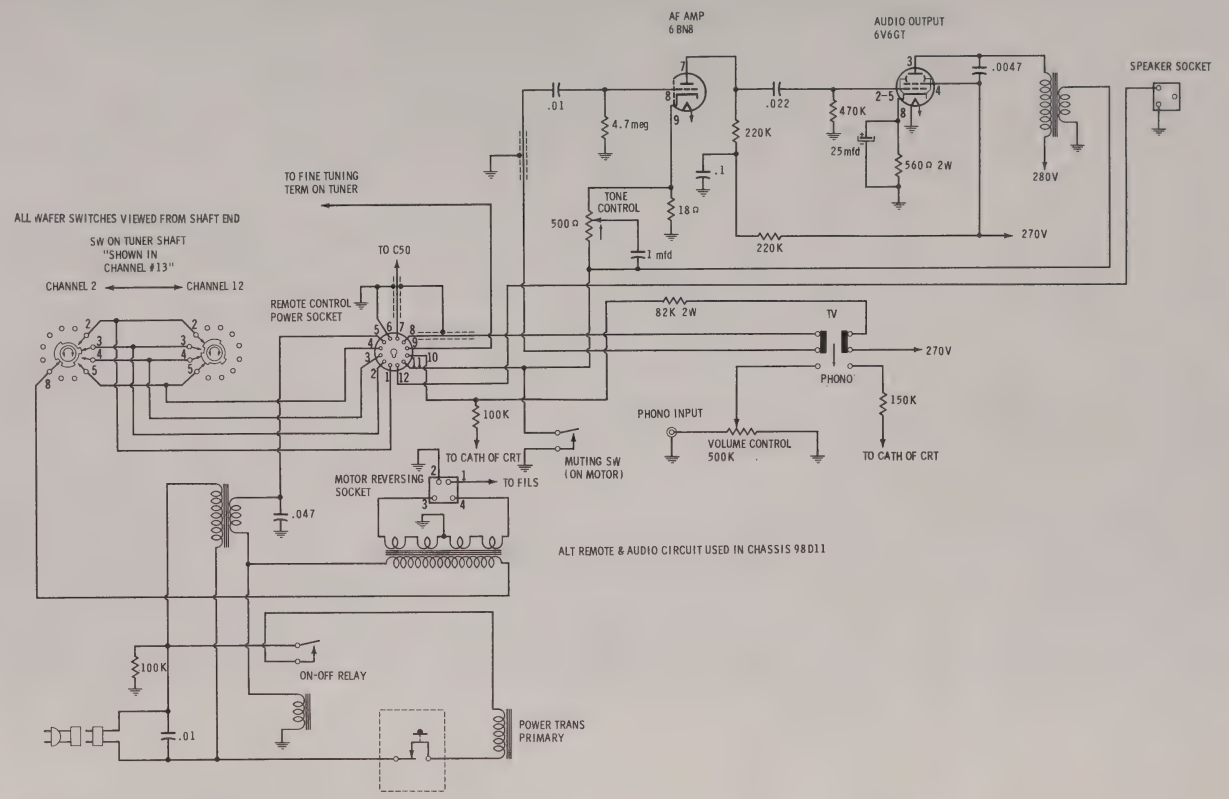
REMOTE CONTROL RM-500, RM-501



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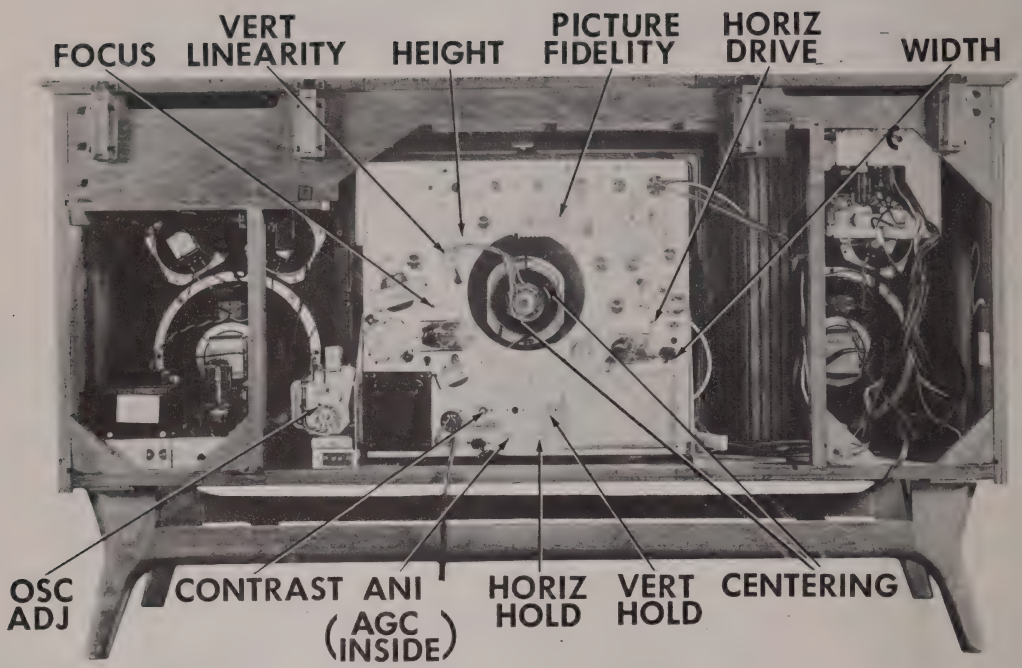
ALTERNATE CIRCUITS - REMOTE CONTROL RM-500, AUDIO CIRCUIT IN TV CH. 98D11



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set Brightness and Contrast for a normal picture.

Turn the Horizontal Hold (Freq. Slug) clockwise until the picture loses sync. It may be necessary to switch off channel and back again for the picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the Horizontal Drive Control until the white lines disappear.

If the Horizontal Drive was adjusted, tune in a TV station and readjust the Horizontal Hold as above.

Adjust the Adjust Width Slug (B1) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

DISASSEMBLY INSTRUCTIONS

TV CHASSIS REMOVAL

1. Remove 10 wood screws holding rear cover.
2. Remove rear cover.
3. Disconnect remote plugs and FM-AM Tuner plug (at TV Chassis). ts).
4. Disconnect picture tube socket, hi voltage lead , picture tube ground lead, and remove yoke.
5. Remove 3 TV chassis bolts and 1 screw.
6. Remove 1 nut at top of chassis (on left side).
7. Remove chassis.

PICTURE TUBE REMOVAL

It is necessary to remove the TV Chassis for picture tube removal.

PHOTOFACT® Folder

AIRLINE MODELS WG-2810A, WG2811A, WG-2815A, WG-2816A, WG-2817A

AIRLINE MODELS WG-2810A, WG2811A, WG-2815A, WG-2816A, WG-2817A

MODEL WG-2815A

AIRLINE MODELS WG-2810A, WG2811A, WG-2815A, WG-2816A, WG-2817A

TRADE NAME	Airline Models WG-2810A, WG-2811A, WG-2815A, WG-2816A, WG-2817A		
SUPPLIER	Montgomery Ward & Co., 619 Chicago Avenue, Chicago 7, Illinois		
TYPE SET	AC Operated 14 Tube FM-AM Receiver With Stereo Amplifier and 4 Speed Automatic Record Changer		
POWER SUPPLY	105 — 125 Volts AC, 60 Cycles	RATING	130 Watts, 1.2 Amp. @117 Volts AC (Less Motor)
TUNING RANGE—BROADCAST	535 — 1620KC	FREQ. MOD.	88 — 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

SET 537 FOLDER 3

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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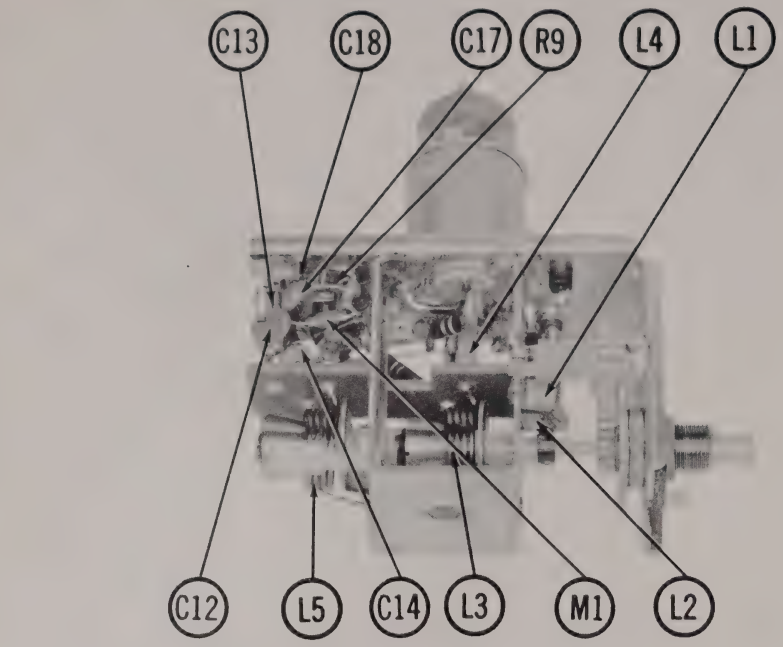
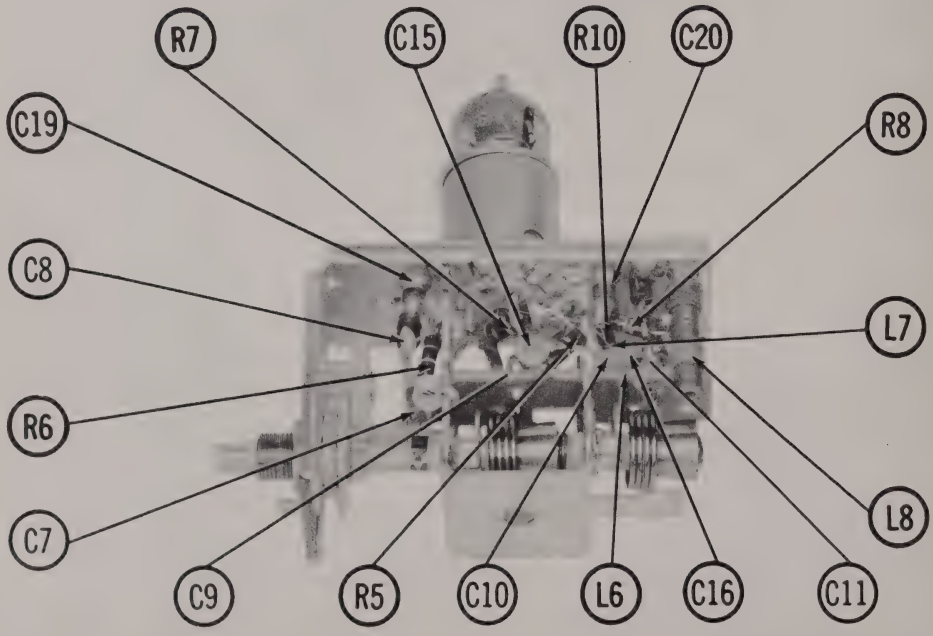
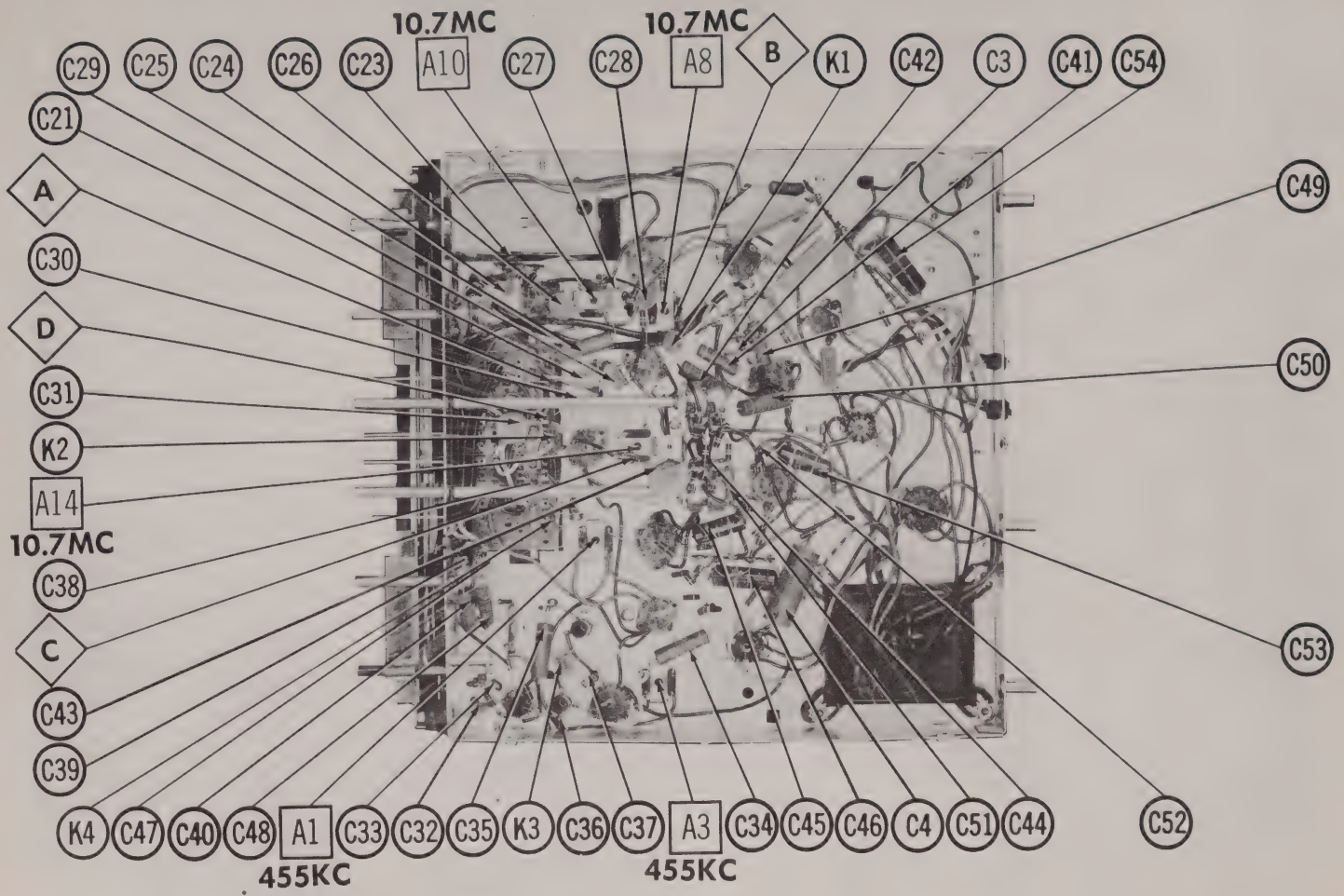
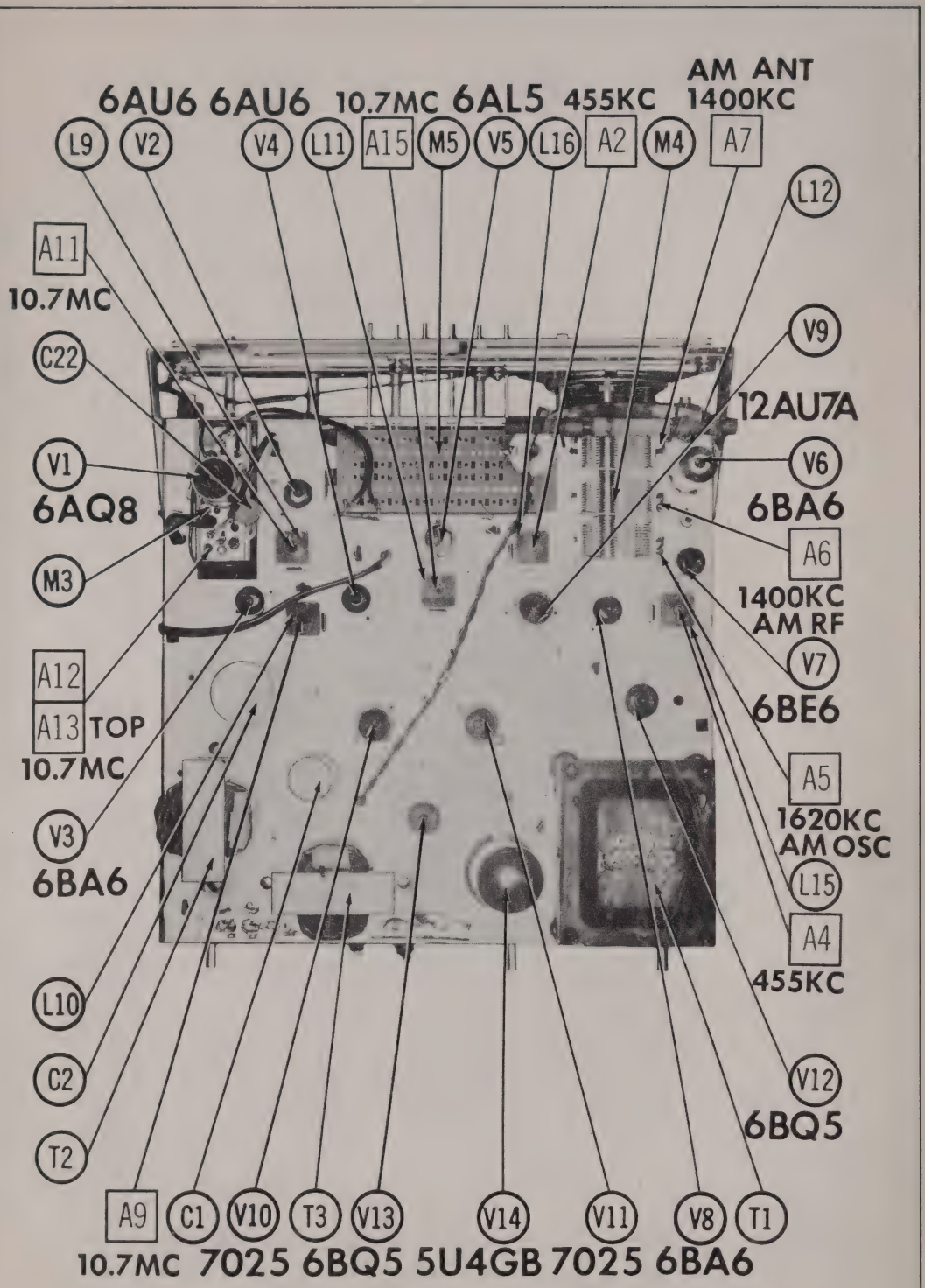




FM RF SUBCHASSIS



CHASSIS BOTTOM VIEW-ALIGN., CAPACITOR & COMPONENT COMBINATION IDENT.



CHASSIS-TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loudness control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A6, A7.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A8 thru A11, A14, A15. GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A12, A13.....GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side thru 470Ω to external antenna lead. Low side to chassis.	1620KC	"	"	A5	"
3.	"	1400KC	1400KC Signal.	"	A6, A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to point Ⓐ. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
5.	"	"	"	DC probe thru 1meg to point Ⓒ. Common to chassis.	A14	"
6.	"	"	"	DC probe to point Ⓓ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to point Ⓐ. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
5.	"	"	"	Vert. amp. thru 47K to point Ⓒ. Low side to chassis.	A14	"
6.	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of cross-over lines.

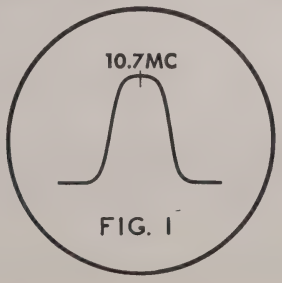


FIG. 1

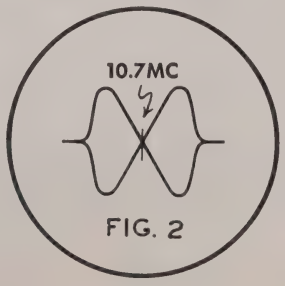
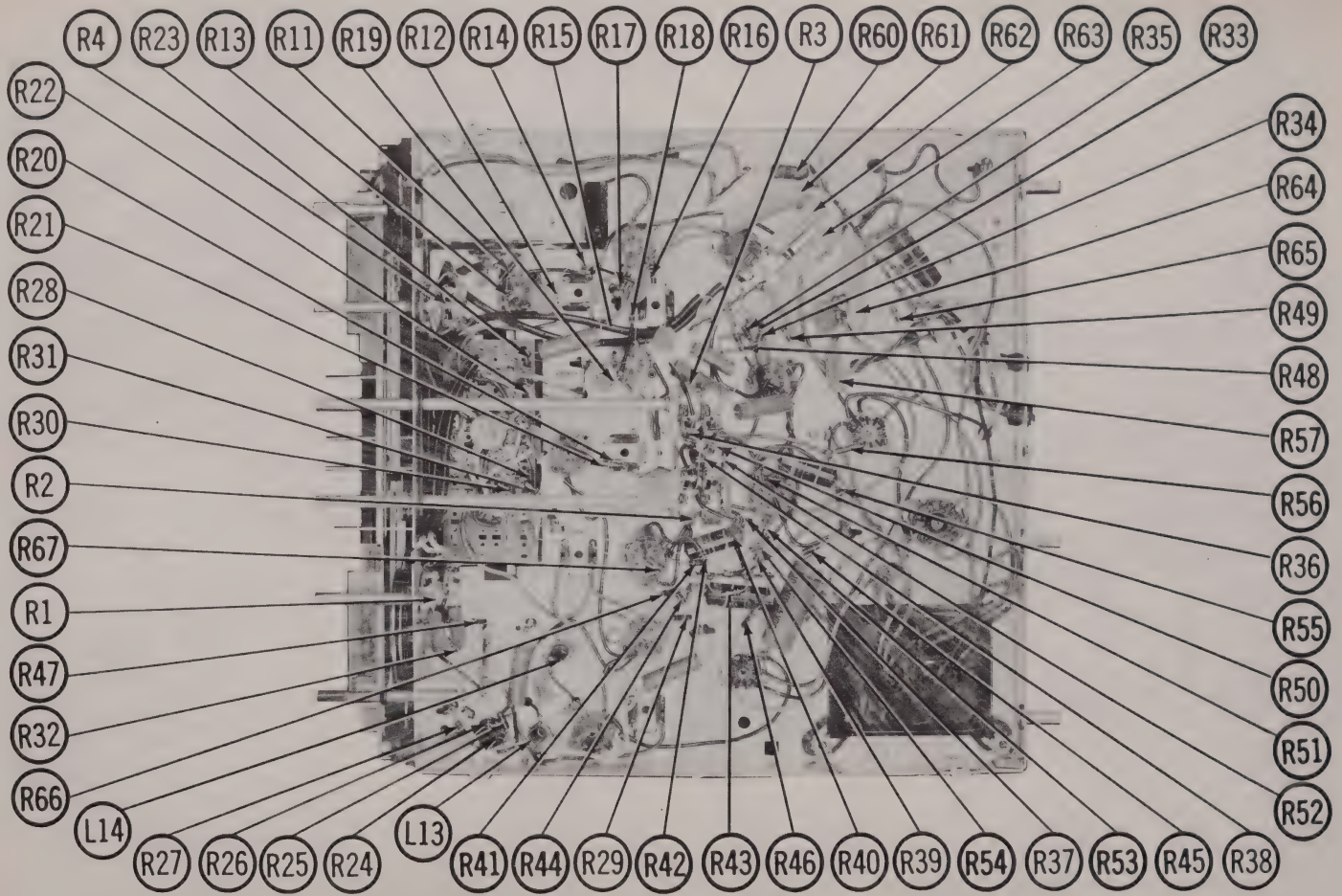
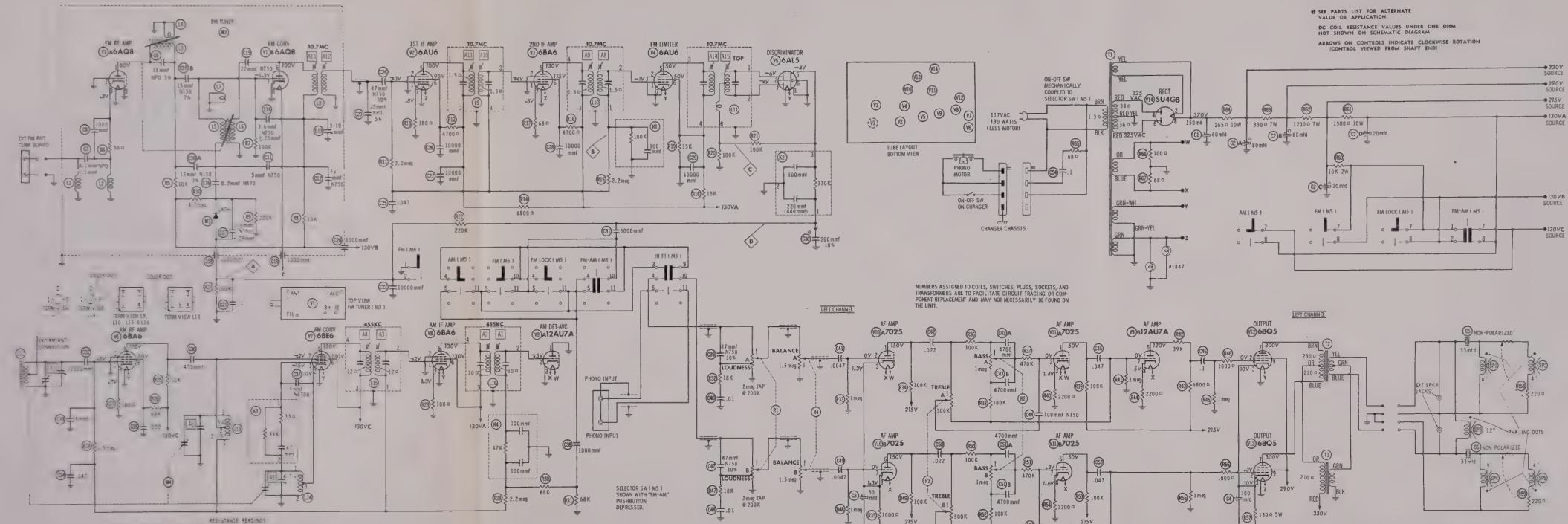


FIG. 2



CHASSIS BOTTOM VIEW-INDUCTOR & RESISTOR IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AQ8	100K	0Ω	560Ω	.1Ω	0Ω	122K	100K	0Ω	0Ω
V2	6AQ8	4.5meg	0Ω	0Ω	0Ω	0Ω	118K	115K	180Ω	FIL
V3	6BA6	2.4meg	0Ω	1Ω	0Ω	0Ω	†3200Ω	†8000Ω	68Ω	FIL
V4	6AU6	100K	0Ω	1Ω	0Ω	0Ω	118K	118K	0Ω	FIL
V5	6AL5	0Ω	100K	1Ω	0Ω	0Ω	200K	0Ω	100K	FIL
V6	6BA6	3.8meg	0Ω	1Ω	0Ω	0Ω	†13K	†70K	180Ω	FIL
V7	6BE6	9MEG	3Ω	1Ω	0Ω	0Ω	†3200Ω	†3200Ω	2.3meg	FIL
V8	6BA6	2.3meg	0Ω	1Ω	0Ω	0Ω	†3200Ω	†3200Ω	180Ω	FIL
V9	12AU7A	1Ω	185K	0Ω	40Ω	40Ω	†48K	1meg	2200Ω	40Ω
V10	7025	†100K	1meg	1000Ω	40Ω	40Ω	†100K	1meg	1000Ω	40Ω
V11	7025	†100K	1.7meg	2200Ω	40Ω	40Ω	†100K	1.7meg	2200Ω	40Ω
V12	6BQ5	NC	1meg	130Ω	1Ω	0Ω	NC	†700Ω	NC	†600Ω
V13	5U4GB	NC	1meg	130Ω	1Ω	0Ω	NC	†690Ω	NC	†800Ω
V14	5U4GB	NC	¶ 25K	NC	34Ω	NC	36Ω	NC	¶ 25K	FIL

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V14. NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of +15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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AIRLINE MODELS WG-2810A, WG2811A, WG-2815A, WG-2816A, WG-2817A

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	FM RF Amp. -FM Conv.	6AQ8
V2	1st FM IF Amplifier	6AU6
V3	2nd FM IF Amplifier	6BA6
V4	FM Limiter	6AU6
V5	Discriminator	6AL5
V6	AM RF Amplifier	6BA6
V7	AM Converter	6BE6
V8	AM IF Amplifier	6BA6
V9	AM Det. -AVC- Left Channel AF Amp.	12AU7A
V10	Left Channel AF Amp. - Right Channel AF Amp.	7025
V11	Left Channel AF Amp. - Right Channel AF Amp.	7025
V12	Left Channel Output	6BQ5
V13	Right Channel Output	6BQ5
V14	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	60	450	45X479	AFH1-53	A0490	FP146	TMS-1780	TVL-1728	
						TC75			
C2A	▲80	450	45X480			FP391.1	TMT-3763	TVL-3789	
B	■60	450				TC80	TD-20-450	TVA-1716	
C	▲20	450							
D	20	450							
C3	50	20	45X456	PRS1265	BBR50-25	TC29	TD-50-25	TVA-1206	
C4	100	25	45X449	PRS1270	BBR100-25	TC2501	TD-100-25	TVA-1207	
C5	33	10NP	45X481	PRS7200	BR4015	TCN1025		TVANS-1115*	
C6	33	10NP	45X481	PRS7200	BR4015	TCN1025		TVANS-1115*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	8.2 NPO ± .5mmf		NPO-DI 8.2		C10V82C			10TCC-V82
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	18 NPO 5%			TCZ-18	C10Q18C		CNO-418	10TCC-Q18
C10A	15 N150 7%	#13L-033				*		10TCP-Q15
B	15 N150 7%			*		*		10TCP-Q15
C11	5 N750			DTN-5	C10V5U	CCTN-050	CN7-550	10TCU-V50
C12	56 N750		N750-DI 56	TCN-56	C10Q56U	CCTN-560	CN7-456	10TCU-Q56
C13	3-10	#19B-902-9		829-10				
C14	3.6 N750 ± .25mmf	#13L8UJR6C						
C15	22 N750		N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C16	8.2 N470					*		
C17	3.6 N750 ± .25mmf	#13L8UJR6C						
C18	1000		EF-001	MFT-1000		CCF-102	CT280A	
C19	1000		EF-001	MFT-1000		CCF-102	CT280A	
C20	1000		EF-001	MFT-1000		CCF-102	CT280A	
C21	.1 100V		P288N-1	DF-104	CUB2P1	IDP-2-104	GEM-201	2TM-P10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C23	12 NPO 5%			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C24	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C25	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	200 10%	Note 1	DI-200	DD-201	L10T2	CCD-201	GP320	10TS-T20
C31	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	9		NPO-SI 10	TCZ-10	C10V9C	CCTO-100	CNO-410	10TCC-Q10
C34	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C35	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C36	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C37	9 N4700	#47X632				*		
C38	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C39	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C40	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C41	.0047 200V		P288N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C42	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C43A	4700		BPD-2X0047	DD-472	BYC6DD47	CCD-472	B-247	5HK-2D47
B	4700			DD-472		CCD-472	B-247	
C44	100 N150					*		10TCP-T10
C45	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C46	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C47	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C48	.01 200V		P288N-01	D6-103	CUB4S1	4DP-3-104	GEM-411	4TM-S10
C49	.0047 200V		P288N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C50	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C51A	4700		BPD-2X0047	DD-472	BYC6DD47	CCD-472	B-247	5HK-2D47
B	4700			DD-472		CCD-472	B-247	
C52	100 N150					*		10TCP-T10
C53	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C54	.1 100V		P288N-1	DF-104	CUB2P1	IDP-2-104	GEM-201	2TM-P10

Airline Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Not used in some versions when 220mmf (Part of K2) is 440mmf.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	36X430	BT-174				Loudness, Left Channel
	200K Tap			*				
B	2meg	½		STR-174				Loudness, Right Channel
	200K Tap			*				
R2A	1meg	½	40X487	AB-69				Bass, Left Channel
B	1meg	½		SR-69				Bass, Right Channel
C	Shaft			AK-10				
R3A	500K	½	40X488	AB-59				Treble, Left Channel
B	500K	½		SR-59				Treble, Right Channel
C	Shaft			AK-10				
R4A	1.5meg	½	36X431				FA26A	Balance, Left Channel
B	1.5meg	½					RU26R	Balance, Right Channel
C	Shaft						CS3500	

* Use tap #1

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R5	10K			
R6	56Ω			
R7	100K			
R8	10K			
R9	220K			
R10	4.7meg			
R11	2.2meg			
R12	4700Ω			
R13	180Ω			
R14	6800Ω			
R15	2.2meg			
R16	4700Ω			
R17	68Ω			
R18	15K			
R19	15K			
R20	100K			
R21	100K			
R22	220K			
R23	100K			
R24	1.5meg			
R25	10K			
R26	68K			
R27	180Ω			
R28	2.2meg			
R29	100Ω			
R30	68K			
R31	68K			
R32	18K			
R33	1meg			
R34	100K			
R35	1000Ω			
R36	100K			

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R37	470K			
R38	100K			
R39	100K			
R40	2200Ω			
R41	1meg			
R42	39K			
R43	6800Ω			
R44	2200Ω			
R45	1meg			
R46	1000Ω			
R47	18K			
R48	1meg			
R49	100K			
R50	100K			
R51	470K			
R52	100K			
R53	100K			
R54	2200Ω			
R55	1meg			
R56	1000Ω			
R57	130Ω 5W	PW5-130	5W-SQ-130	
R58	220Ω			
R59	220Ω			
R60	10K 2W			
R61	1500Ω 10W	PW10-1500	10W-SQ-1500	
R62	1200Ω 7W	PW7-1200	7W-SQ-1200	
R63	330Ω 7W	PW7-330	7W-SQ-330	
R64	265Ω 10W	PW10-265	10W-SQ-265	
R65	68Ω			
R66	100Ω			
R67	68Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA
K1	FM IF Grid Bias	100mmf, 100K	76X28	
K2	Audio Coupling Network	100mmf, 220mmf, 330K	76X33	
K3	AM Osc. Coil Coupling	47mmf, 33Ω, 39K	76X20	
K4	AM Diode Filter	100mmf, 100mmf, 47K	76X30	Aerovox PA-97 Centralab PC-50 Sprague D-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	FM Ant.	34A-1002					
L2	RF Choke	24A-1002-01					
L3	FM Ant.	31T-3543					
L4	Trap	31K-338-01					
L5	FM Osc. Sec.	31T-3682					
L6	FM Osc. Prim.	26R1-34BONR-92					
L7	Trap	31K-338-01					

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L8	1st FM IF	31U-619					
L9	2nd FM IF	9A2440	FM-254	1463	RTC-8599	T633	
L10	3rd FM IF	9A2440	FM-254	1463	RTC-8599	T633	
L11	Discriminator	9A2450	FM-255	1465	RTC-8600	T635	
L12	Loopstick	9A2474	BC-419	705-A		T523	
L13	AM RF	9A2473					
L14	AM Osc.	9A2472	BC-393	70-OSC	RTC-8647	T512	
L15	1st AM IF	9A2469	BC-352	12-C1	RTC-8632	T607	
L16	2nd AM IF	9A2470	BC-353	12-C2	RTC-8633	T608	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V@ 1.2A	650VCT @.150A DC	5V@ 3A	53X393					
	SEC. 3	SEC. 4	SEC. 5						
	12.6VCT @ 2.3A	6.3V @ .9A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	32	1	51X221					
T3	10	1	51X222					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	6"	PM	6-8Ω	12A584	6A15Z6.4	
SP2	4"	PM	3-4Ω	12A543-2	4A05	
SP3	12"	PM	14-16Ω	12A583	12A6AZ16	
SP4	6"	PM	6-8Ω	12A584	6A15Z6.4	
SP5	4"	PM	3-4Ω	12A543-2	4A05	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		AIRLINE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M1		24A-009				AFC (Part of FM Tuner)

PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	AIRLINE PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2			17D	Not Req.	26SD	S1-1 * & S3-3 *	8TA4-SD	N-8TA-SD *	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	FM Tuner	25A1203	Complete
M4	Tuning Cap.	14A243	AM, 3 Gang (Ant. 13-332mmf, RF 12-217mmf, Osc. 10-143mmf)
M5	Switch	2A531	Function Selector, Pushbutton Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	58X836	
Dial Pointer	15X292	FM
Dial Pointer	15X293	AM
Knob	10A1021-2	Tuning
Knob	10A1021-1	Loudness, Bass, Treble, Balance
Pushbutton	10A1020-1	Off-On
Pushbutton	10A1020-2	AM
Pushbutton	10A1020-3	FM
Pushbutton	10A1020-4	FM Lock
Pushbutton	10A1020-5	AM-FM
Pushbutton	10A1020-6	Hi-Fi
Leg	81X30-2	Cabinet, Oak, Model WG-2811A

WIRING DATA

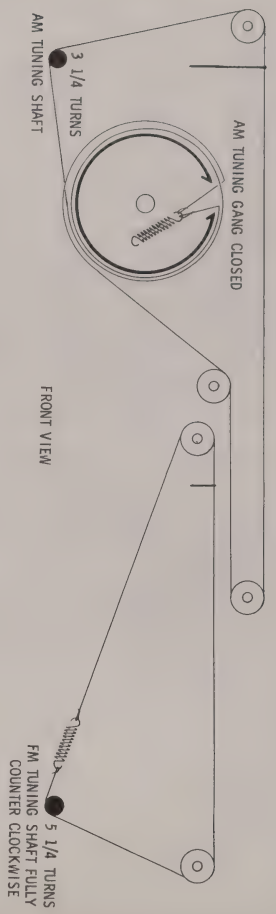
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

DIAL CORD STRINGING



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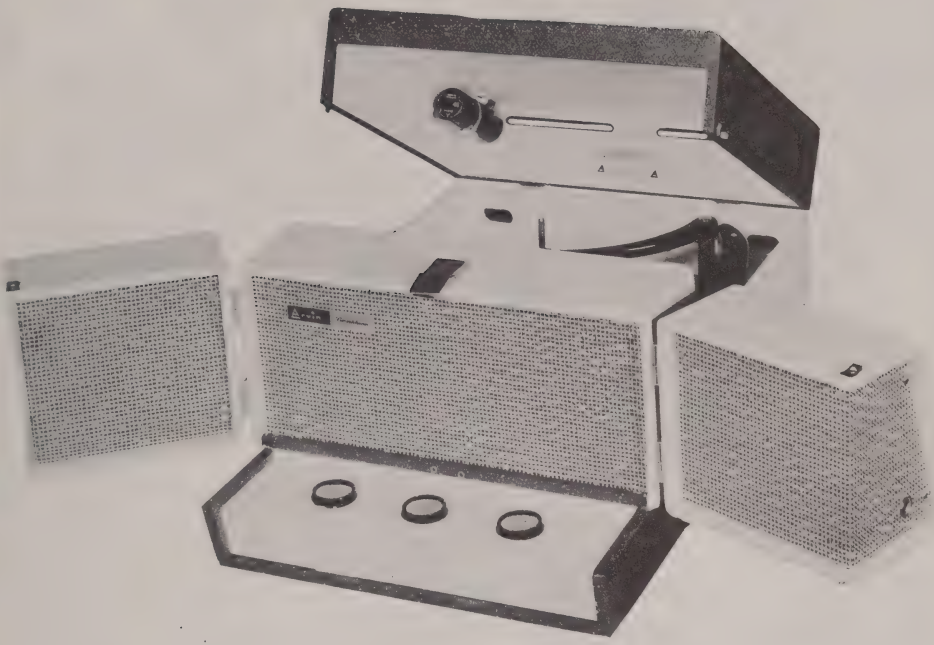
ARVIN
MODEL 90P38 (Ch. 1.61001)

ARVIN
MODEL 90P38 (Ch. 1.61001)



ARVIN
MODEL 90P38 (Ch. 1.61001)

TRADE NAME	Arvin Model 90P39 (Ch. 1.61001)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 30 Watts, .3 Amp. 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER – SEE SIMILAR COLLARO CONQUEST (REVISED) – PHOTOFACT SET 408 FOLDER 6 OR RECORD CHANGER MANUAL RC-11

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KT537

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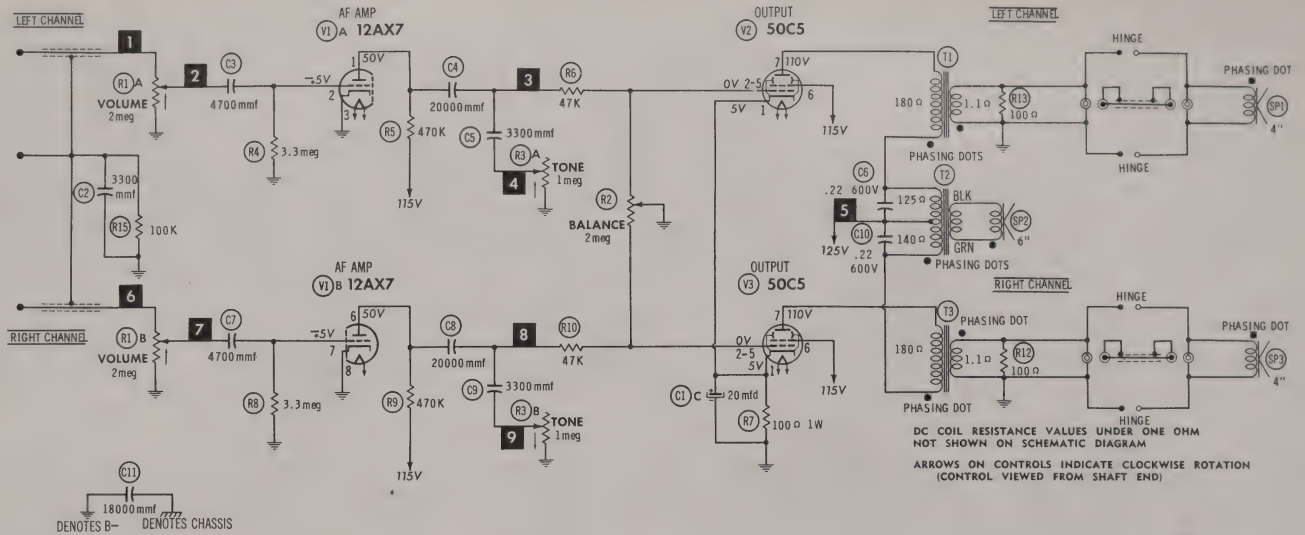
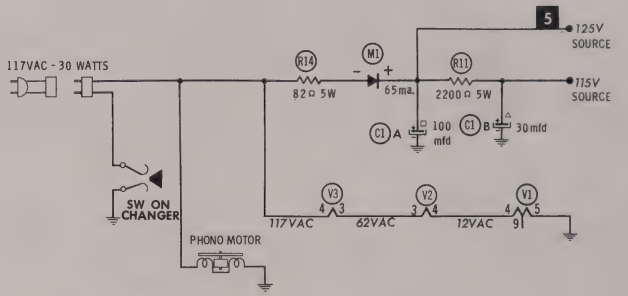


RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†470K	3.3meg	0Ω	20Ω	0Ω	†470K	3.3meg	0Ω	NC
V2	50C5	100Ω	1meg	80Ω	20Ω	NC	†2200Ω	†305Ω		
V3	50C5	100Ω	1meg	80Ω	175Ω	1meg	†2200Ω	†320Ω		

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

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ARVIN
MODEL 90P38 (Ch. 1.61001)

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆)
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7
V2	Left Channel Output	50C5
V3	Right Channel Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■100	150	43711-8	PWH3-81-50	C0610 †	PFP311.12	TMT-3097 ‡	PCL-3431.1	
B	▲30	150							
C	20	25							

† Use Printed Circuit Adapters #55277 & 55278.
‡ Use Printed Circuit Adapter Kit TMA.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C3	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C4	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C5	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C6	.22 600V		P688N-22		CUB6P22	6DP-5-224	GEM-6022	6TM-P22
C7	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-332	5HK-D33
C10	.22 600V		P688N-22		CUB6P22	6DP-5-224	GEM-6022	6TM-P22
C11	18000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg		47100-1					Volume, Left Channel
B	2meg							Volume, Right Channel
R2	2meg		45250-17					Balance
R3A	1meg		47100-2					Tone, Left Channel
B	1meg							Tone, Right Channel

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	3.3meg			
R5	470K			
R6	47K			
R7	100Ω 1W			
R8	3.3meg			
R9	470K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R10	47K			
R11	2200Ω 5W	PW5-2200	5W-SQ-2200	
R12	100Ω			
R13	100Ω			
R14	82Ω 5W	PW5-82	5W-SQ-82	
R15	100K			

PRINTED BOARD

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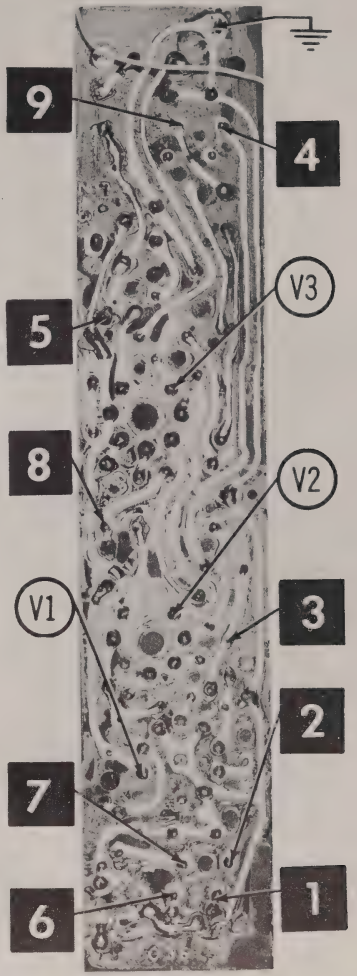
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ARVIN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω	6-8Ω	46200-1				S-62X	
T2	2600Ω	6-8Ω	46200-1				S-62X	
T3	3500Ω CT	6-8Ω	48921-1				S-53X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	4"	PM	6-8Ω	44088	4A1Z4.6	
SP2	6"	PM	6-8Ω	46408-3	6A1Z6.9	
SP3	4"	PM	6-8Ω	44088	4A1Z4.6	

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	ARVIN PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.065A	47126-1	1N1763	2F4	SR200	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	ARVIN PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2	46507-4	Not Req.	13T	Not Req.	13	Not Req.	10TB9-S	Not Req.	

CABINETS & CABINET PARTS

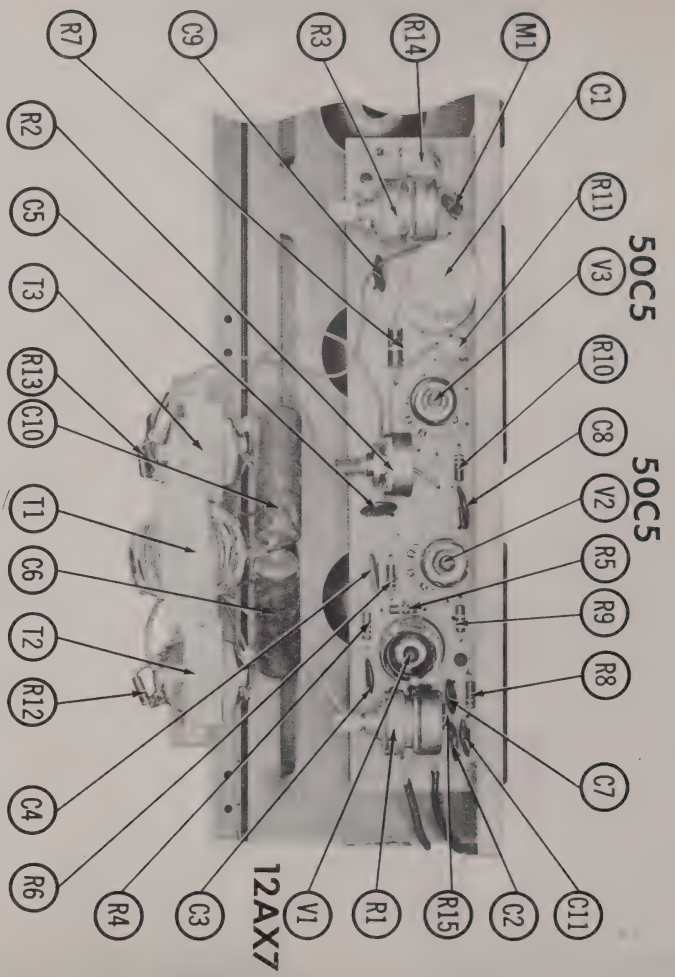
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	48987-29	Volume
Knob	48985-29	Balance
Knob	48986-29	Tone
Cabinet	48900-9	Charcoal
Cabinet	48903-1	Speaker, Left
Cabinet	48903-2	Speaker, Right

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—TOP VIEW



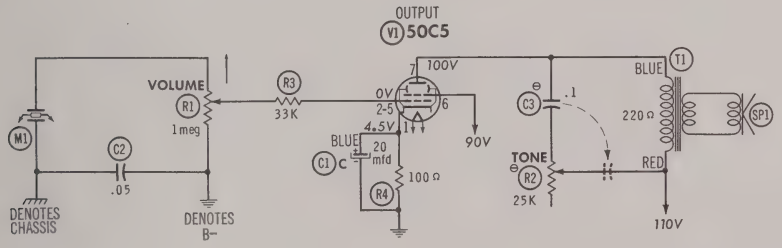
PHOTOFACT® Folder

CORONADO MODELS PH13-4013A, PH13-4020B, PH13-4021B

CORONADO MODELS PH13-4013A, PH13-4020B, PH13-4021B

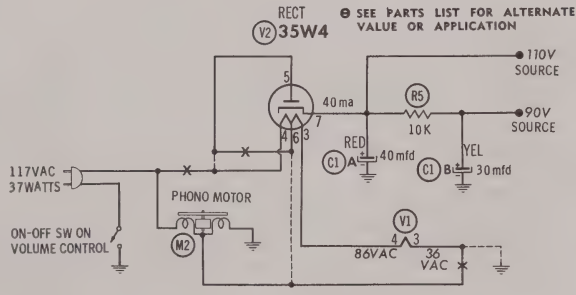
MODEL PH13-4013A

TRADE NAME	Coronado Models PH13-4013A, PH13-4020B, PH13-4021B
SUPPLIER	Gamble-Skogmo, Inc., 15 N. Eighth Street, Minneapolis 3, Minn.
TYPE SET	AC Operated 2 Tube Phono Amplifier With 4 Speed Manual Record Player
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 37 Watts, .4 Amp. @117 Volts AC



Pin No.	V1	V2
1	50C5	35W4
2	100Ω	NC
3	33K	TP
4	10Ω	50Ω
5	50Ω	25Ω
6	NC	35Ω
7	†10K	35Ω
	†220Ω	INF

† MEASURED FROM PIN 7 OF V2
NC NO CONNECTION TP TIE POINT



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KR525

SET 537 FOLDER 5

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Output	50C5	V2	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	EC-71	PRS3625	BBRT43215	TCT3105	TDLT-3	TVA-3448	
B	30	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C3	.1 400V	Note 1	P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10

Note 1. Not used in Models PH13-4020B, PH13-4021B

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	VC-70	B-70-S	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2A	25K	½	VC-71 ①	B-26	A47-25K-S	Q11-120	U29	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

① Not used in Models PH13-4020B, PH13-4021B

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	33K			
R4	100Ω			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	10K			

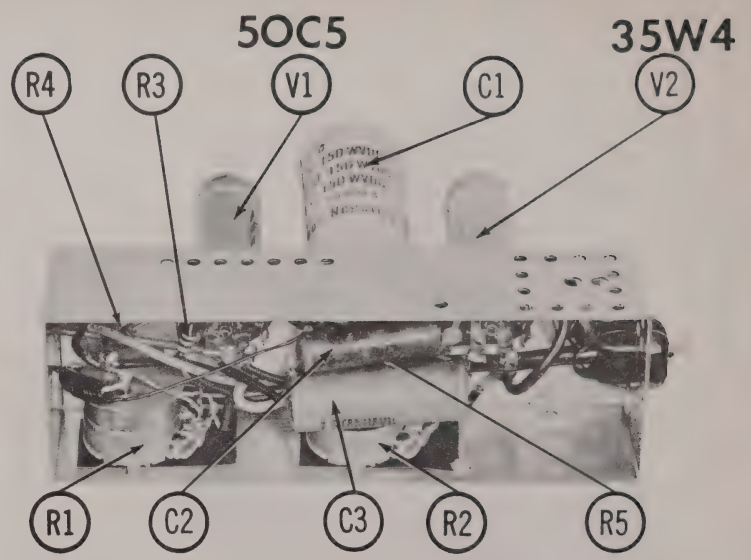
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA CORONADO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3100Ω	3-4Ω	(Part of SP1)	A-3025	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA CORONADO PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	SPK-89B *	4A07	* Includes T1

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	CORONADO PART No. CARTRIDGE	CORONADO PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M1	PU-51	NE-17 * (LP)	420-TS-TB KR-314T①	N8-3 *	46T	Not Req.	12TH-S T-8C1-12TH-S ①	Not Req.	① Tone arm includes cartridge & needles.
		NE-16 * (78 RPM)		N8-1 *					

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M2	Motor Idler Wheel	4M20	4 Speed, Complete WALSCO Part No. 1433

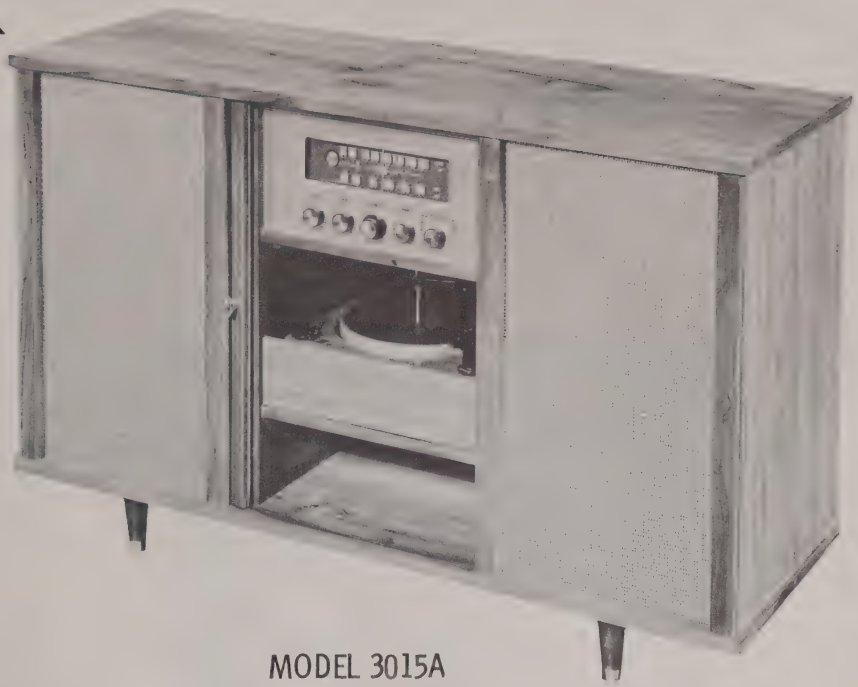
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

CURTIS MATHES MODELS 3015A, 3115A, 3215A (Ch. 15A)

CURTIS MATHES MODELS
3015A, 3115A, 3215A (Ch. 15A)



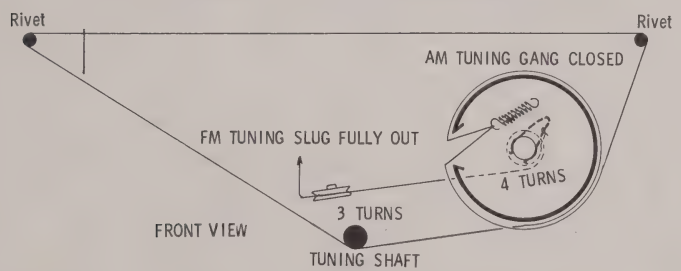
MODEL 3015A

CURTIS MATHES MODELS
3015A, 3115A, 3215A (Ch. 15A)

TRADE NAME	Curtis Mathes Models 3015A, 3115A, 3215A (Ch. 15A)		
MANUFACTURER	Curtis Mathes Mfg. Co., 2220 Young Street, Dallas, Texas		
TYPE SET	AC Operated FM-AM Receiver With Stereo Amplifier and 4 Speed Automatic Record Changer		
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles	RATING	82 Watts, .75 Amp. @117 Volts AC (Less Motor)
TUNING RANGE—BROADCAST	535 – 1620KC	FREQ. MOD.	88 – 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #11A6 – SEE SIMILAR COLLARO CONQUEST (REVISED) – PHOTOFACT SET 408 FOLDER 6 OR RECORD CHANGER MANUAL RC-11

DIAL CORD STRINGING



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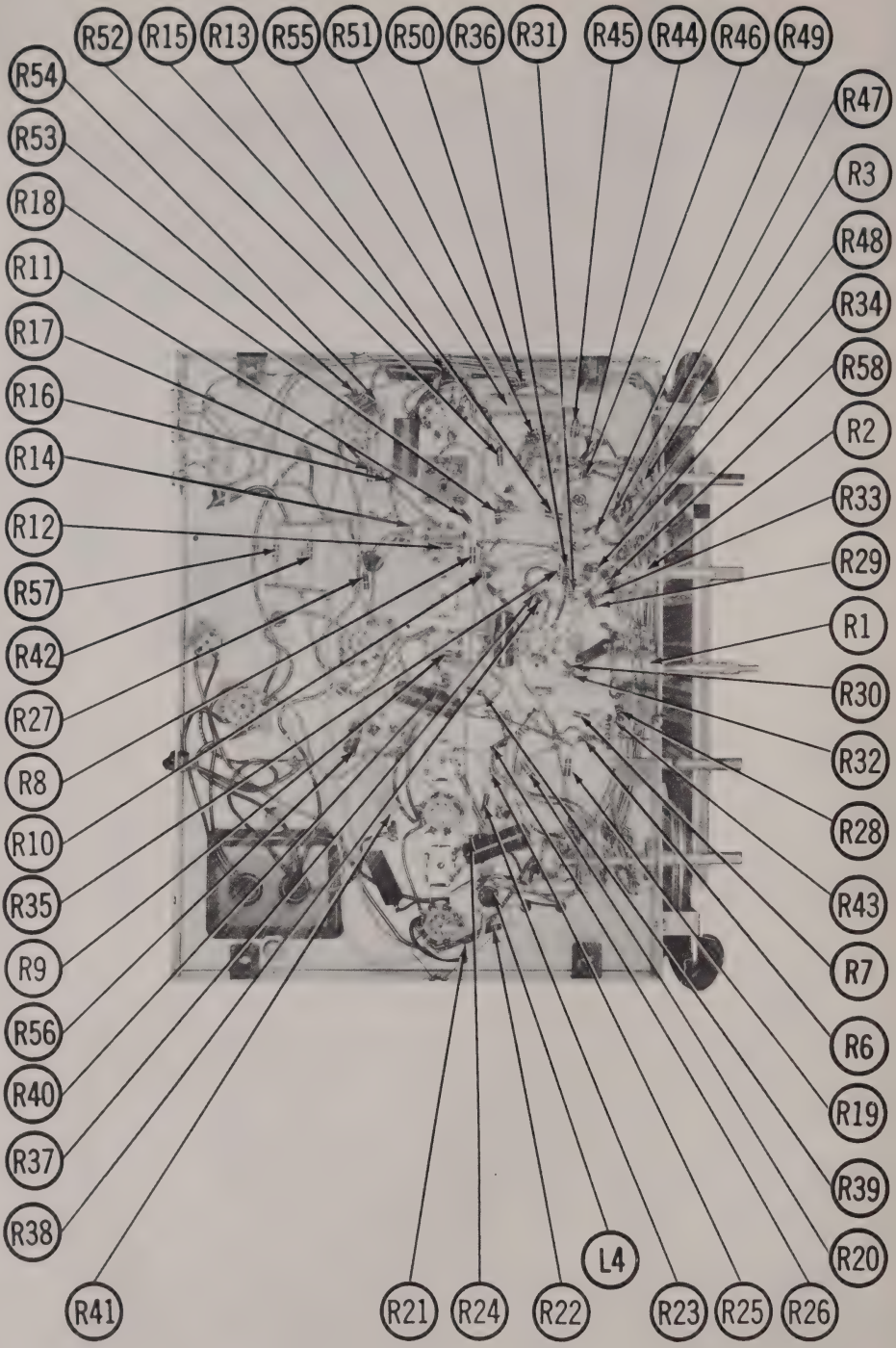
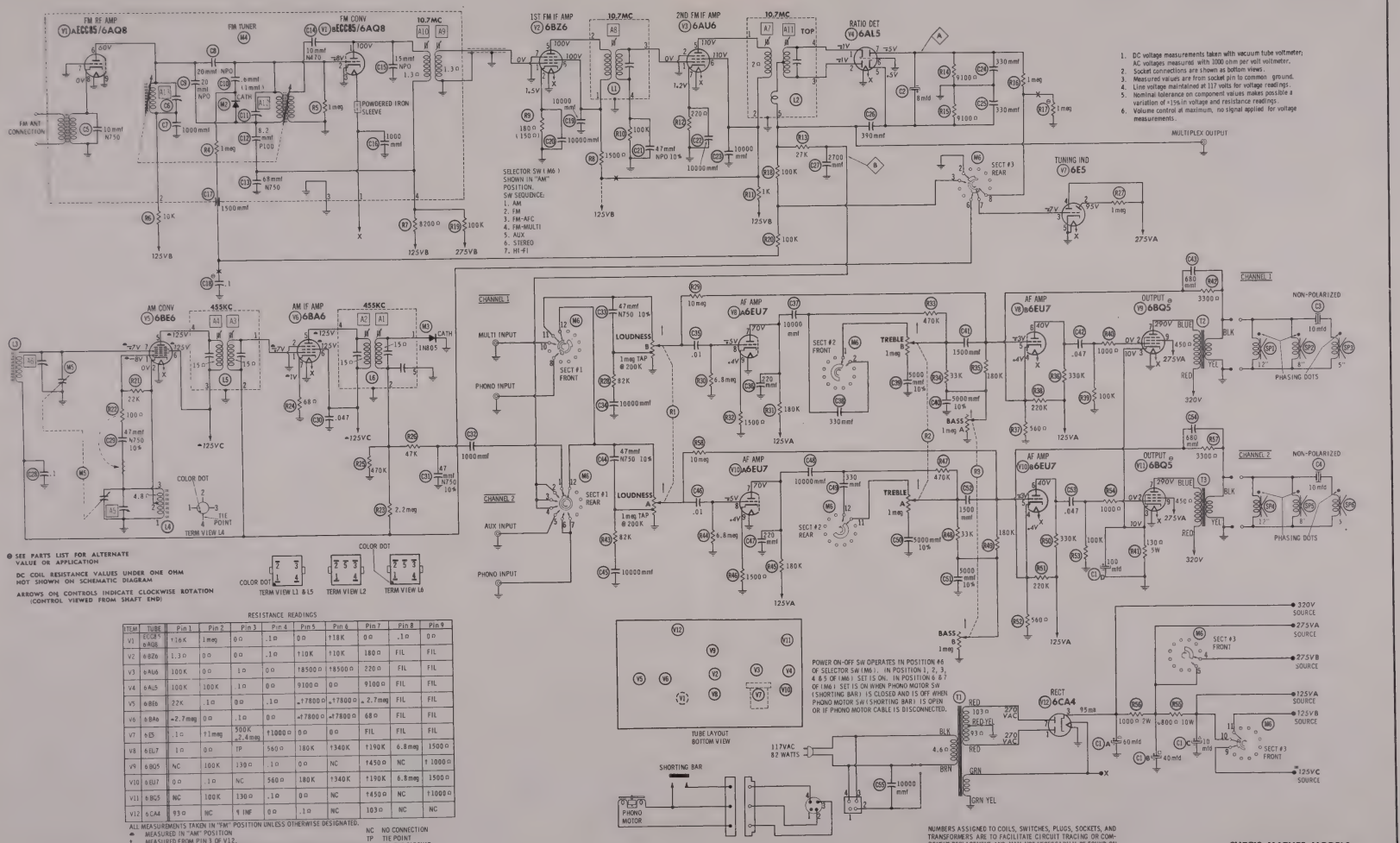
KN501

SET 537 FOLDER 6



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85 & 6AQ8	†16K	1meg	0Ω	.1Ω	0Ω	†18K	0Ω	.1Ω	0Ω
V2	6BZ6	1.3Ω	0Ω	0Ω	.1Ω	†10K	†10K	180Ω	FIL	FIL
V3	6AU6	100K	0Ω	1Ω	0Ω	†8500Ω	†8500Ω	220Ω	FIL	FIL
V4	6AL5	100K	100K	1Ω	0Ω	9100Ω	0Ω	9100Ω	FIL	FIL
V5	6BE6	22K	.1Ω	0Ω	.1Ω	▲7800Ω	▲7800Ω	▲2.7meg	FIL	FIL
V6	6BA6	▲2.7meg	0Ω	.1Ω	0Ω	▲7800Ω	▲7800Ω	68Ω	FIL	FIL
V7	6E5	.1Ω	††1meg	500K ▲2.4meg	††1000Ω	0Ω	0Ω	FIL	FIL	FIL
V8	6EU7	1Ω	0Ω	TP	560Ω	180K	†340K	†190K	6.8meg	1500Ω
V9	6BQ5	NC	100K	130Ω	.1Ω	0Ω	NC	†450Ω	NC	†1000Ω
V10	6EU7	0Ω	.1Ω	NC	560Ω	180K	†340K	†190K	6.8meg	1500Ω
V11	6BQ5	NC	100K	130Ω	.1Ω	0Ω	NC	†450Ω	NC	†1000Ω
V12	6CA4	¶3Ω	NC	¶ INF	0Ω	.1Ω	NC	103Ω	NC	NC

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "AM" POSITION
† MEASURED FROM PIN 3 OF V12.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.

NC NO CONNECTION
TP TIE POINT

POWER ON-OFF SW OPERATES IN POSITION #6 OF SELECTOR SW (M6). IN POSITION 1, 2, 3, 4 & 5 OF (M6) SET IS ON. IN POSITION 6 & 7 OF (M6) SET IS ON WHEN PHONO MOTOR SW (SHORTING BAR) IS CLOSED AND IS OFF WHEN PHONO MOTOR SW (SHORTING BAR) IS OPEN OR IF PHONO MOTOR CABLE IS DISCONNECTED.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

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CURTIS MATHES MODELS 3015A, 3115A, 3215A (Ch. 15A)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loudness control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A4, A8, A12, A13... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

A5, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A7, A11..... GENERAL CEMENT #9091, 9091-L
WALSCO #2542

A9, A10..... GENERAL CEMENT #9440

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to antenna stator lug of tuning gang. Low side to chassis.	455KC (400∿ 30% AM)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1620KC	"	"	A5	"
3.	Loop	1400KC	1400KC Signal.	"	A6	Set pointer to 1400KC. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat Steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Across FM antenna terminals.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A7, A8, A9, A10	Adjust for maximum deflection.
5.	"	"	"	DC probe to point Ⓑ. Common to chassis.	All	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	Across FM antenna terminals.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A7, A8, A9, A10	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
5.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	All	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

FM Tuner cord should be snug when tuner is set to High Frequency End.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 120Ω in each lead.	100MC	(FM) 100MC	DC probe to point Ⓐ. Common to chassis.	A12, A13	Adjust for maximum deflection.

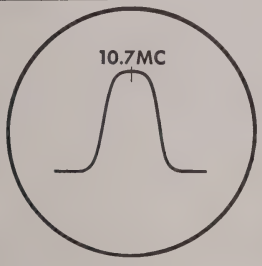


FIG. 1

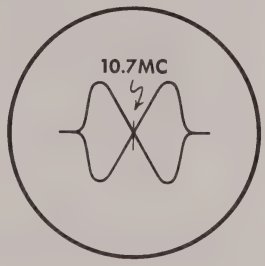
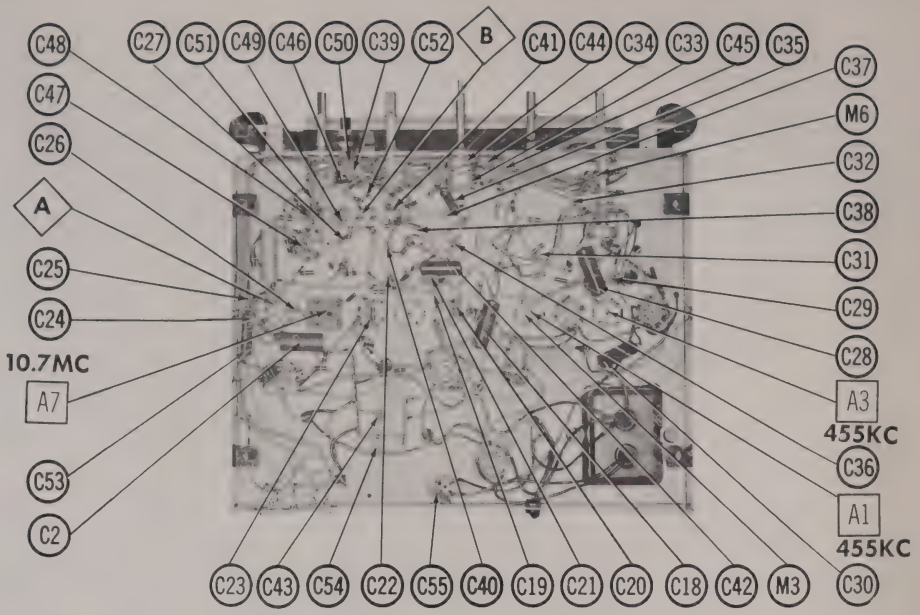
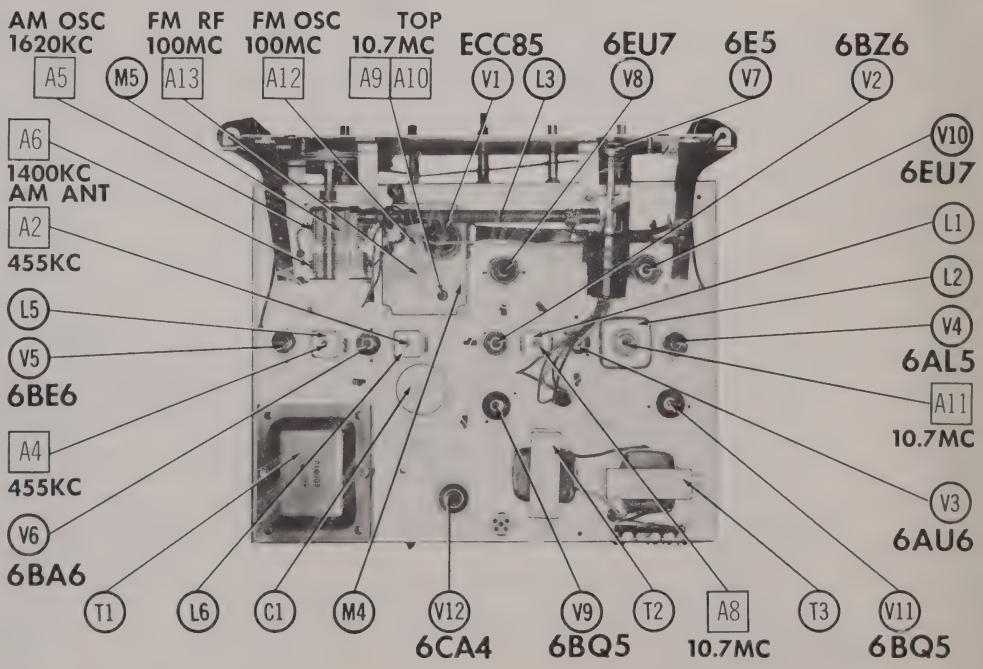


FIG. 2



CHASSIS BOTTOM VIEW-ALIGNMENT & CAPACITOR IDENT.



CHASSIS TOP VIEW-ALIGN., INDUCTOR, MISC. & TRANSF. IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	ECC85/ 6AQ8
V2	1st FM IF Amplifier	6BZ6
V3	2nd FM IF Amplifier	6AU6
V4	Ratio Detector	6AL5
V5	AM Converter	6BE6
V6	AM IF Amplifier	6BA6

ITEM No.	USE	TYPE
V7	Tuning Indicator	6E5
V8	Channel 1 AF Amp.	6EU7
V9	Channel 1 Output	6BQ5 (EL85) *
V10	Channel 2 AF Amp.	6EU7
V11	Channel 2 Output	6BQ5 (EL85) *
V12	Rectifier	6CA4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Curtis Mathes PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	400	4A4	AFH4-123	D0477.5	FP454.8	TMQ-4722	TVL-4811	
B	■40	400							
C	▲10	400							
D	100	25							
C2	8	25	4A18-B	PRS1405	BBR8-150	TT25X8	TD-8-150	TVA-1405	
C3	10	25NP		PRS7315	BBR10-150	TCN5010		TVANS-1204.1*	
C4	10	25NP		PRS7315	BBR10-150	TCN5010		TVANS-1204.1*	

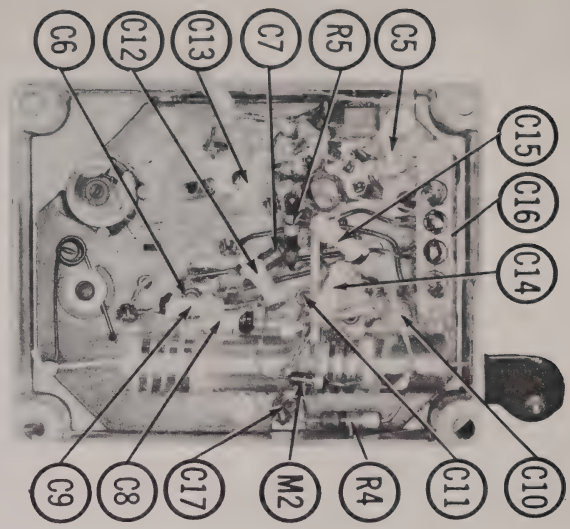
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10 N750		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C6								
C7	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C8	20 NPO		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C9	20 NPO		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C10	.6 P100	(1) †						
C11								
C12	8.2 P100					*		
C13	68 N750		N750-SI 68	TCN-68	C10Q68U	CCTN-68	CN7-468	10TCU-Q68
C14	10 N470					*		
C15	15 NPO		NPO-SI 15	TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C16	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	1500		EF-0015					
C18	.1 200V	Note 1	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	330		DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C25	330		DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C26	390		DI-390	DD-391	L10T39	CCD-391	B-339	10TS-T39
C27	2700		DI-2700	DD-272	BYA10D27	CCD-272	B-227	10TS-D27
C28	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C29	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-470	10TCU-Q47
C30	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C31	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C32	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C33	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C36	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C37	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C38	330		DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C39	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C40	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C41	1500		BPD-0015	DD-1500	BYA10D15	CCD-152	B-215	5HK-D15
C42	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

FM RF SUBCHASSIS



FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C43	680		DI-680	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C44	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C45	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C46	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C47	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C48	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C49	330		DI-330	DD-331	L10T33	CCD-331	B-331	10TS-T33
C50	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C51	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C52	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C53	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C54	680		DI-680	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C55	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

† Alternate Value.
Note 1. Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Curtis Mathes PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg 200K Tap	½	2A38	F1-59				Loudness, Channel 2
B	1meg 200K Tap	½		R2-59				Loudness, Channel 1
C	Spring			AK-32				Friction Drive

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Curtis Mathes PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R2A	1meg		2A39	B-70	AD47-1meg-Z		FA16A	Treble, Channel 2
B	1meg			SR-70	Not Req.		RU16A	Treble, Channel 1
C	Shaft			Not Req.	FS-3		CS3500	
R3A	1meg		2A39	B-70	AD47-1meg-Z		FA16A	Bass, Channel 1
B	1meg			SR-70	Not Req.		RU16A	Bass, Channel 2
C	Shaft			Not Req.	FS-3		CS3500	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	1meg			
R5	1meg			
R6	10K			
R7	8200Ω			
R8	1500Ω			
R9	180Ω			(150Ω) *
R10	100K			
R11	1000Ω			
R12	220Ω			
R13	27K			
R14	9100Ω			
R15	9100Ω			
R16	1meg			
R17	1meg			Note 1
R18	100K			
R19	100K			
R20	100K			
R21	22K			
R22	100Ω			
R23	2.2meg			
R24	6Ω			
R25	470K			
R26	47K			
R27	1meg			
R28	82K			
R29	10meg			
R30	6.8meg			
R31	180K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R32	1500Ω			
R33	470K			
R34	33K			
R35	180K			
R36	330K			
R37	560Ω			
R38	220K			
R39	100K			
R40	1000Ω			
R41	130Ω 5W	PW5-130	5W-SQ-130	
R42	3300Ω			
R43	82K			
R44	6.8meg			
R45	180K			
R46	1500Ω			
R47	470K			
R48	33K			
R49	180K			
R50	330K			
R51	220K			
R52	560Ω			
R53	100K			
R54	1000Ω			
R55	6800Ω 10W	PW10-6800	10W-SQ-6800	
R56	1000Ω 2W			
R57	3300Ω			
R58	10meg			

* Alternate Value.
Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Curtis Mathes PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	2nd FM IF	1A10	FM-254	1463	RTC-8599	T633	
L2	Ratio Detector	1A9	FM-252	1465	RTC-8600	T635	
L3	Loopstick	1A35	BC-418	705-A		T532	
L4	AM Osc.	1A36	BC-393	69-OSC	RTC-8646	T503	
L5	1st AM IF	1A7	BC-352	12-C1	RTC-8632	T607	
L6	2nd AM IF	1A8	BC-355	12-C6	RTC-8634	T609	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Curtis Mathes PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V @ .75A	540 VCT @ .095A DC	6.3V @ 5.3A	12A10		PM-8405 ①	24R20 ①	R-112B ①	① Tape 5V and CT on 6.3V Windings. Drill new mounting hole (s).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Curtis Mathes PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7300Ω	2-4Ω	10A15-3A	A-2905 ①	A-3824	22S62	S-9X	① Drill New Mounting Hole (s).
T3	7200Ω	2-4Ω	10A15-4A	A-2905 ①	A-3824	22S62	S-9X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Curtis Mathes PART No.	QUAM PART No.	NOTES
SP1	12"	PM	3-4Ω	12JB-38A	12A6A	
SP2	8"	PM	6-8Ω	8EV-39	8A1Z8.4	
SP3	5"	PM	6-8Ω	5CM-98	5A15Z7.8	
SP4	12"	PM	3-4Ω	12JB-38A	12A6A	
SP5	8"	PM	6-8Ω	8EV-39	8A1Z8.4	
SP6	5"	PM	6-8Ω	5CM-98	5A15Z7.8	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA Curtis Mathes PART No. CARTRIDGE	Curtis Mathes PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M1			13TB	Not Req.	26S	S1-1 * & S3-3 *	8TA4-S	N-8TA-S *	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Curtis Mathes PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N805			1N60	1N60	AFC (Part of FM Tuner)
M3						AM Detector

MISCELLANEOUS

ITEM No.	PART NAME	Curtis Mathes PART No.	NOTES
M4	Tuner	7A4	FM, Complete
M5	Tuning Cap.	3A8	AM, 2 Gang
M6	Switch	6A22	Function Selector (Rotary Wafer Type) Includes Off-On

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	2B11	
Knob	11B4	Tuning, Function, Tone
Knob	11B7-1	Loudness
Knob	11B6-1	Loudness

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

DECCA
MODEL DP-613

DECCA
MODEL DP-613

DECCA
MODEL DP-613

TRADE NAME	Decca Model DP-613
MANUFACTURER	Decca Distributing Corp., 445 Park Ave., New York 22, N. Y.
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Manual Record Player
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 57 Watts, .56 Amp. @ 117 Volts AC (Less Motor)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KR618

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	ECC83/12AX7	V3	Channel 2 Output	EL84/6BQ5
V2	Channel 1 Output	EL84/6BQ5	V4	Rectifier	EZ81/6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA DECCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▬60	400	CE-136	AFH4-79-40	C1080	FP369.1	TMT-3682	TVL-3636.5	
B	■40	350			BR6045	TC795	TD-50-450	TVA-1714	
C	▲40	300							
D	50	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C3	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C6	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C7	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C10	1.5 200V				WMF2W1P5E			
C11	1.5 200V				WMF2W1P5E			

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA DECCA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3meg	½	VC-331				FA36T95	Loudness, Channel 2
	1meg Tap							
B	3meg						RU36T16	Loudness, Channel 1
	1meg Tap							
C	Shaft						CS3500	
R2A	500K	½	VC-270	B-60	AD47-500K-Z		FA55A	Treble, Channel 2
B	500K	½		SR-60	Not Req.		RU55A	Treble, Channel 1
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	3meg	½	VC-269	B-85			FC36A	Bass, Channel 2
B	3meg	½		SR-85			RU36A	Bass, Channel 1
C	Shaft			Not Req.			CS3500	
R4A	10meg	½	VC-330	B-98	A47-10meg-S	Q11-143	U82	Balance, Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

Note 1. Some versions may use 5meg in this application.

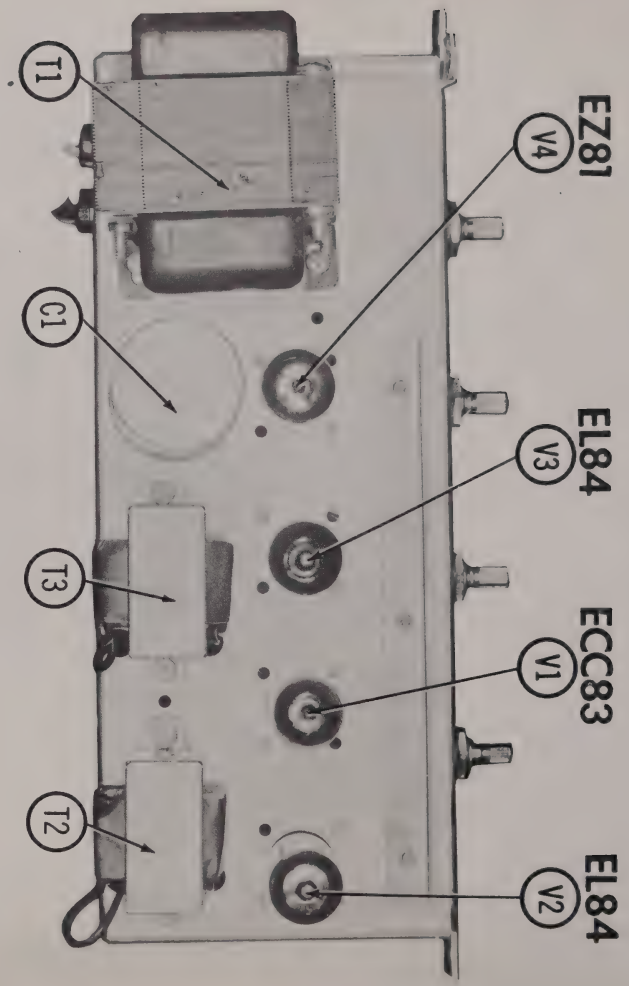
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	68K			
R6	100K			
R7	100K			
R8	6.8meg			
R9	680Ω			
R10	5600Ω			
R11	1000Ω			
R12	82Ω 3W	PW3-82	3W-SQ-82	
R13	100Ω			
R14	68K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R15	100K			
R16	100K			
R17	6.8meg			
R18	680Ω			
R19	5600Ω			
R20	1000Ω			
R21	100Ω			
R22	1200Ω 1W			
R23	270Ω 5W	PW5-270	5W-SQ-270	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	DECCA PART No.	REPLACEMENT DATA
K1	Audio Coupling	250mmf, 10000mmf, 250K, 500K		Aerovox PA-112-4 Centralab or PC-81 Sprague T-2
K2	Audio Coupling	250mmf, 10000mmf, 250K, 500K		Aerovox PA-112-4 Centralab PC-81 Sprague T2

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	DECCA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V ⓐ .56A	500VCT ⓐ .100A DC	6.3V ⓐ 2.7A	TR-180	P-3148 ①	PC-8420 ①	24R13U ① ②	R-110A ① ②	① Drill New Mounting Hole(s) ② Tape 5V Winding and CT on 6.3V Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	DECCA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5400Ω	3-4Ω	TR-184	A-3019	A-8092	26S49	S-5Z	
T3	5400Ω	3-4Ω	TR-184	A-3019	A-8092	26S49	S-5Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DECCA PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	SP-804	8A21	
SP2	3½"	PM	3-4Ω	SP-420	3A15TZ3.2	
SP3	8"	PM	3-4Ω	SP-804	8A21	
SP4	3½"	PM	3-4Ω	SP-420	3A15TZ3.2	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	DECCA PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M1			86TSTB	N8-7 * & N8-3	96T	Not Req.	12TH-S	Not Req.	

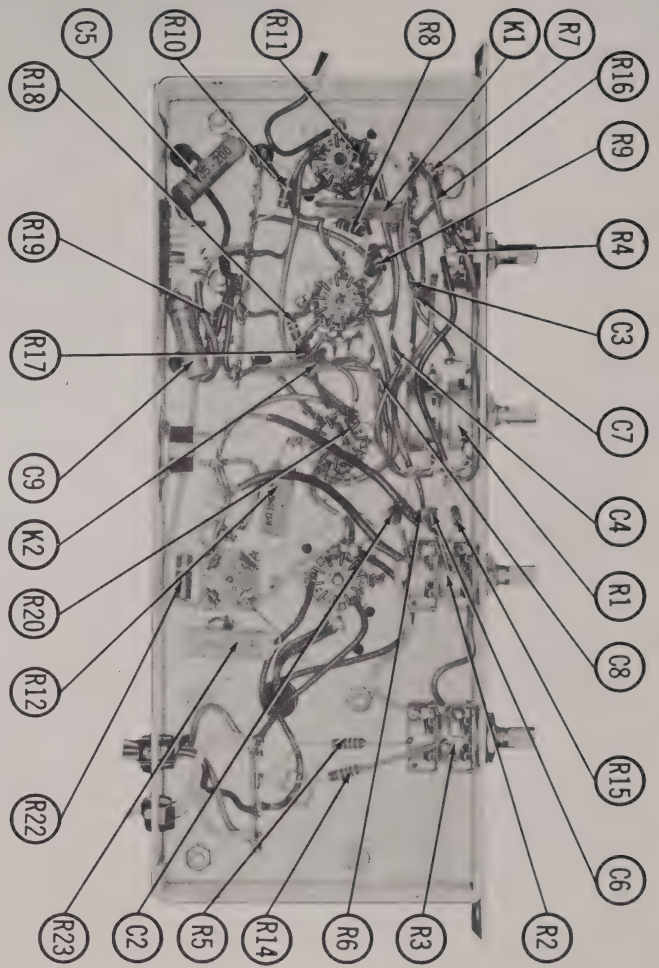
MISCELLANEOUS

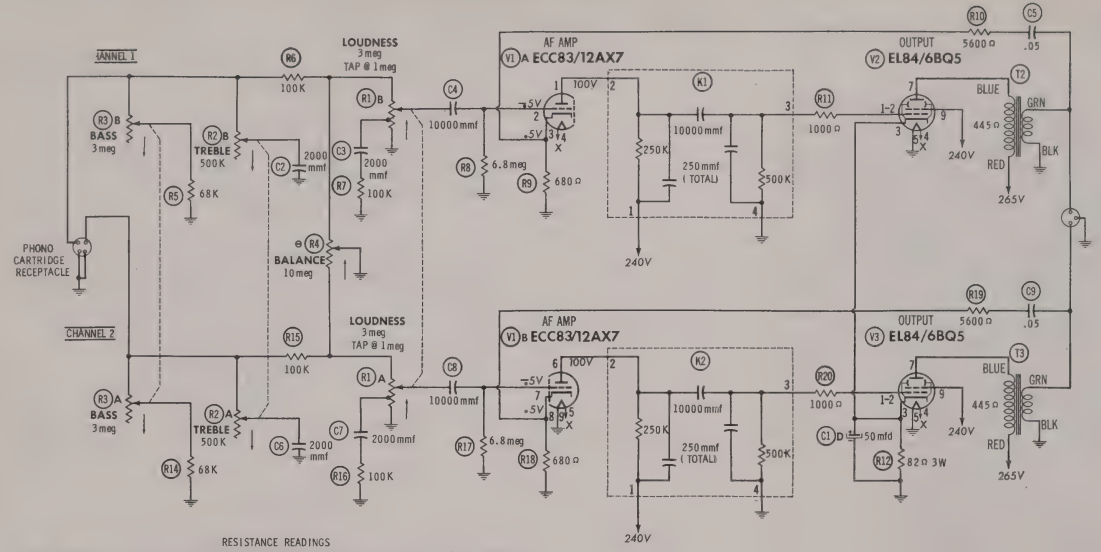
ITEM No.	PART NAME	DECCA PART No.	NOTES
M2	Switch Idler Wheel		Off-On WALSCO Part No. 1472-01

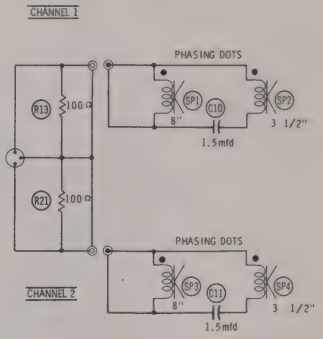
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





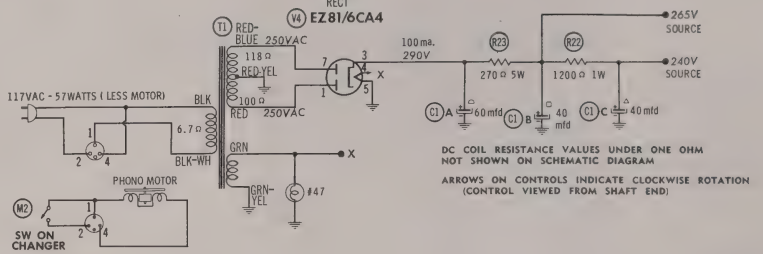


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	†250K	6.8 meg	680 Ω	FIL	FIL	†250K	6.8 meg	680 Ω	
V2	EL84 6BQ5	NC	500K	82 Ω	FIL	FIL	TP	†715 Ω	NC	†1500 Ω
V3	EL84 6BQ5	NC	500K	82 Ω	FIL	FIL	NC	†715 Ω	TP	†1500 Ω
V4	EZ81 6CA4	100 Ω	NC	¶ INF	FIL	FIL	NC	118 Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V4. NC NO CONNECTION TP TIE POINT



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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DECCA
MODEL DP-613

PHOTOFACT® Folder

GOLDEN SHIELD
MODELS 900, 908, 980

GOLDEN SHIELD
MODELS 900, 908, 980

MODEL 980

GOLDEN SHIELD
MODELS 900, 908, 980

TRADE NAME	Golden Shield Models 900, 908, 980
SUPPLIER	Golden Shield Corp., Service Dept., 700 Ellicott Street, Batavia, N. Y.
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 58 Watts, .56 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR GLASER STEERS GS-77 (REVISED) — PHOTOFACT SET 482 FOLDER 11

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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KT578

SET 537 FOLDER 8

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A AF Amp. - Channel B AF Amp.	ECC83/12AX7	V3	Channel B Output	EL84/6BQ5
V2	Channel A Output	EL84/6BQ5	V4	Rectifier	EZ81/6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Golden Shield PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	400	161-4033	AFH4-79-40	C1080	FP369.1	TMT-3682	TVL-3636.5	
B	■40	350			BR6045	TC795	TD-50-450	TVA-1714	
C	▲40	300							
D	50	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C5	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C6	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-210	5HK-D20
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C9	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C10	.47 200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C11	.47 200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Golden Shield PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3meg	½	153-0166	B-85	A47-3meg-Z	Q13-140	U57	Loudness, Channel A
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	3meg	½	153-0166	B-85	A47-3meg-Z	Q13-140	U57	Loudness, Channel B
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½	153-0213	B-60	AD47-500K-Z		FA55A	Treble, Channel B
B	500K	½		SR-60	Not Req.		RU55A	Treble, Channel A
C	Shaft			Not Req.	KSS-3		CS3500	
R4A	3meg	½	153-0212	B-85			FC36A	Bass, Channel B
B	3meg	½		SR-85			RU36A	Bass, Channel A
C	Shaft			Not Req.			CS3500	

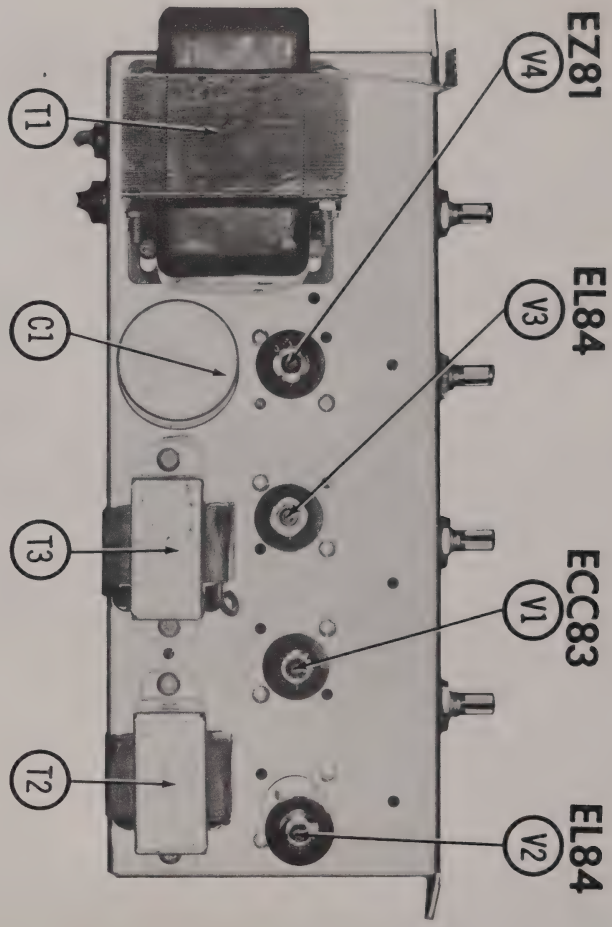
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	100K			
R6	6.8meg			
R7	680Ω			
R8	270Ω			
R9	5600Ω			
R10	1000Ω			
R11	82Ω 3W	PW5-82	5W-SQ-82	
R12	100Ω 1W			
R13	100K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R14	6.8meg			
R15	680Ω			
R16	270Ω			
R17	5600Ω			
R18	1000Ω			
R19	100Ω 1W			
R20	1200Ω 1W			
R21	270Ω 5W	PW5-270	5W-SQ-270	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Golden Shield PART No.	REPLACEMENT DATA
K1	Audio Coupling	250mmf, 10000mmf, 250K, 500K		Aerovox PA-112-4 Centralab PC-81 Sprague T-2
K2	Audio Coupling	250mmf, 10000mmf, 250K, 500K		Aerovox PA-112-4 Centralab PC-81 Sprague T-2

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	Golden Shield PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .56A	500VCT @ .095A	6.3V @ 2.7A	141-0087	P-3148 ①	PC-8420 ①	24R13U ① ②	R-110A ① ②	① Drill new mounting hole(s). ② Tape 5V Winding and CT on 6.3 Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Golden Shield PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5400Ω	3-4Ω	143-0097	A-3019	A-8092	26S49	S-3X	
T3	5400Ω	3-4Ω	143-0097	A-3019	A-8092	26S49	S-3X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Golden Shield PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	539-0612	6A15	
SP2	3½"	PM	3-4Ω	539-0354	3A15TZ3.2	
SP3	3½"	PM	3-4Ω	539-0354	3A15TZ3.2	
SP4	6"	PM	3-4Ω	539-0612	6A15	
SP5	3½"	PM	3-4Ω	539-0354	3A15TZ3.2	
SP6	3½"	PM	3-4Ω	539-0354	3A15TZ3.2	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	Golden Shield PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M1	916-0015	Not Req.	13TB	Not Req.	26S	S1-1 * & S3-3 *	10T	Not Req.	

CABINETS & CABINET PARTS

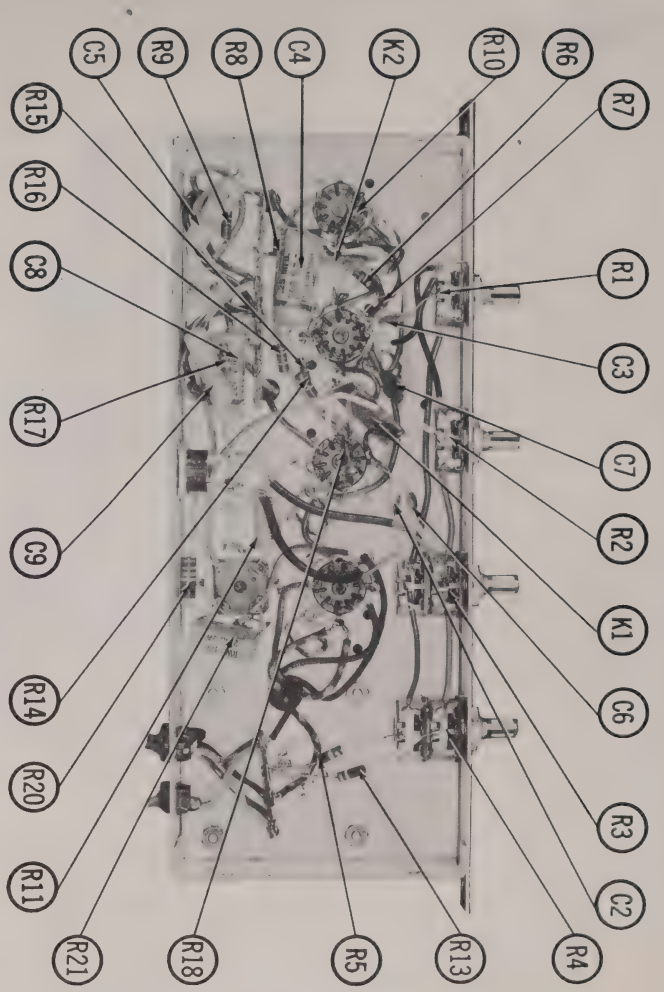
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

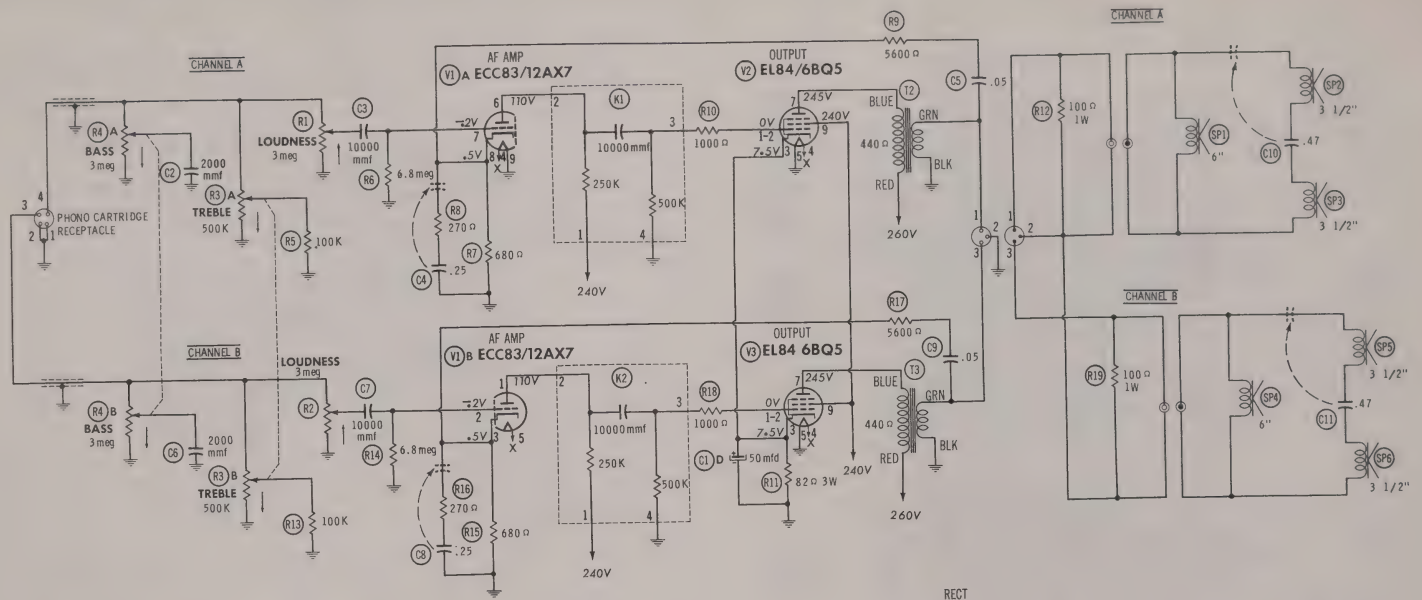
NAME	PART NO.	DESCRIPTION
Knob	740-0369	
Spindle	922-0021	45 RPM

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 ½2AX7	†250K	6.8meg	680Ω	.1Ω	.1Ω	†250K	6.8meg	680Ω	0Ω
V2	EL84 6BQ5	NC	500K	82Ω	.1Ω	0Ω	TP	†710Ω	NC	† 1500Ω
V3	EL84 6BQ5	NC	500K	82Ω	.1Ω	0Ω	NC	†710Ω	TP	†1500Ω
V4	EZ81 6CA4	100Ω	NC	¶ INF	.1Ω	0Ω	NC	95Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V4. NC NO CONNECTION TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

GOLDEN SHIELD
MODELS 900, 908, 980

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT® Folder with CIRCUITRACE®

KNIGHT
MODEL KN-4060 (92RU774)

KNIGHT
MODEL KN-4060 (92RU774)

GENERAL INFORMATION

Knight Model KN-4060 is a three-speed tape recorder and can play back both monaural and stereophonic recordings.

Model KN-4060 will record and play back both monaural and stereo when connected to an appropriate amplifier system. Recordings can be made from a microphone, radio, phonograph, tuner, or TV set.

This model has three tape speeds, 7 1/2, 3 3/4 and 1 7/8 ips. A two-position equalization switch for 7 1/2 ips and 3 3/4 or 1 7/8 ips is provided. Using both tracks, recording times are as follow:

Tape Length	7 1/2 ips	3 3/4 ips	1 7/8 ips
1200 ft.	1 hour	2 hours	4 hours
1800 ft.	1 1/2 hours	3 hours	6 hours
2400 ft.	2 hours	4 hours	8 hours

This recorder operates on 60 cycles, 105-120 volts AC only.

Supplied By:

Allied Radio
100 N. Western Avenue
Chicago 80, Illinois

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of CQ450

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

FUNCTION OF CONTROLS

Power On-Off, Volume Control #1

Turns power on and off for the entire unit. Regulates volume on monaural and first channel stereo playback. Determines the recording level on monaural and first channel stereo recordings.

Volume Control #2

Controls the record level and volume for stereo recording and playback on channel two.

Rotary Speed Selector

Selects the desired tape speed: 7-1/2, 3-3/4 or 1-7/8 ips. This control cannot be turned unless the pushbuttons are in the Stop position.

Equalization Switch

Equalizes the response for 7-1/2 ips speed in the up position, for 3-3/4 and 1-7/8 ips speeds in the down position.

FUNCTION OF PUSHBUTTONS

In order for the pushbuttons to work properly, they should be depressed firmly. All buttons lock into position when depressed except stop and pause. The recorder can be changed from one function to another immediately except from wind and rewind to play; in this case, the stop button must first be depressed.

Stop

Applies brake to both spindles and returns all pushbuttons to neutral.

Record

Moves the play-record switch into record position.

Rewind

Returns tape rapidly to supply reel. Moves wind-rewind pulley, increasing tension on rewind belt which turns the supply spindle.

Wind

Moves tape rapidly in play and record direction. Moves wind-rewind pulley, increasing tension on wind belt which turns the takeup spindle.

Play

Moves the tape for playback (or recording, if Record button is depressed simultaneously). Brings pressure roller and pressure pads into position against the capstan and record head.

Pause

Stops the tape by removing the pressure roller from the capstan and applying the brakes to the spindle. Record or playback settings are not disturbed.

INPUT AND OUTPUT JACKS

The input and output jacks are located on the rear of the recorder. The top left jack is channel 1 input and lower left jack is channel 2 input. The two middle jacks are for monitoring; the upper for channel 1 and the lower for channel 2. The two jacks on the right are the output jacks; the upper for channel 1 and the lower for channel 2.

OPERATING INSTRUCTIONS

Threading the Tape

Place a reel of tape on the left spindle; empty reel on right spindle. Thread the tape in slot with shiny side toward the front of recorder. Insert loose end of tape into one of the slots in the empty reel and turn reel counterclockwise to take up slack in the tape.

To Wind or Rewind Tape

Depress the Wind or Rewind button to move the tape in the desired direction. Depress the Stop button to stop the tape. The recorder will stop automatically at the end of the reel.

To Make a Monaural Recording

Plug the microphone into the Low Level input jack. Set the rotary Speed Selector to the desired speed. Turn the power on with the On-Off-Volume control #1. Allow sufficient time for the tubes to warm up. Depress the Record button and adjust Volume control #1 so the level meter will go into the red portion on the loudest passage. Hold the Record button down and depress the Play button until both are locked in the down position. If both buttons will not stay down or a buzzing sound is heard, the tape is not properly threaded. Depress the Stop button at the end of a recording; at the end of the tape, the recorder will stop automatically.

Hold the microphone approximately eight inches from the mouth when recording voice. Place the microphone two or three feet in front of the loudspeaker when recording from a radio, phonograph, or TV set.

Hold the Pause button down to interrupt a recording briefly. The recorder will continue to record when the Pause button is released.

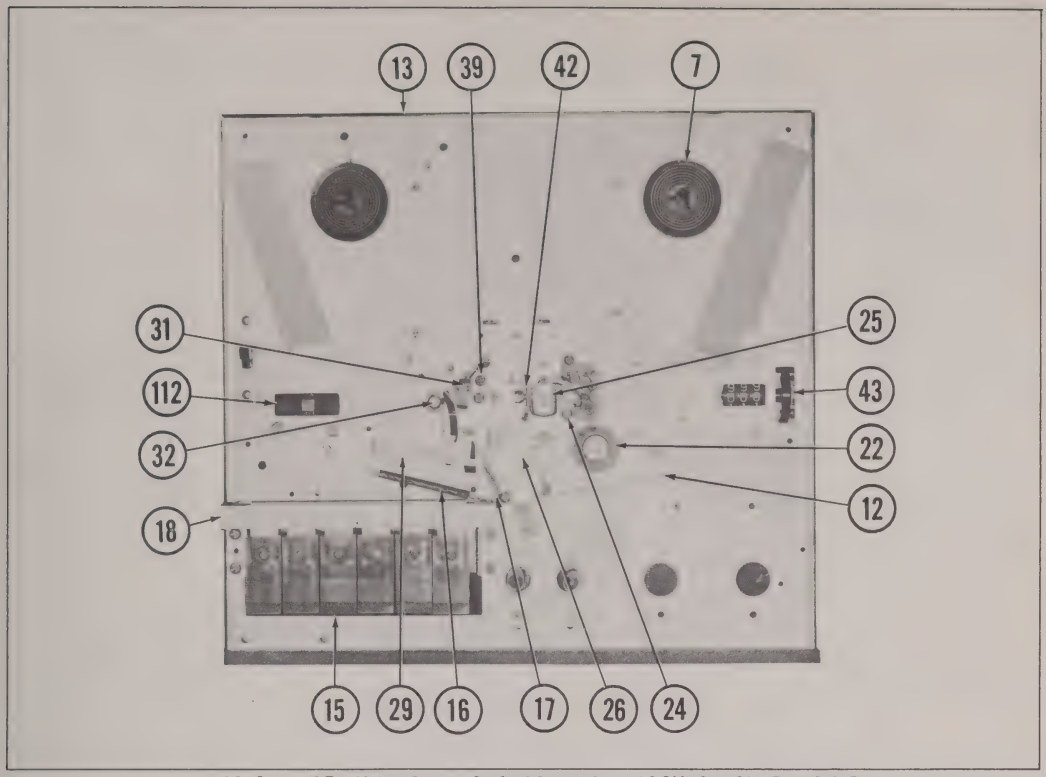


FIG. 1 TOP VIEW OF MECHANISM WITH ESCUTCHEON REMOVED

It is possible to record directly from a radio, phonograph, tuner, or TV set by connecting a patch cord between the High Level jack and the desired instrument.

To Play Monaural Recordings

Thread the tape as described under "Threading the Tape". Connect the recorder to an amplifier system. Depress the Play button. Adjust Volume #1 control. Turn Volume #2 fully counterclockwise.

To Play Stereophonic Tapes

Connect the recorder to a stereo amplifier. Thread the tape and turn the recorder on. Depress the Play button and adjust Volume controls #1 and #2 until the volume level meters are fluctuating equally.

To Make a Stereophonic Recording

Plug one microphone into the upper input jack and another microphone into the lower input jack located on the rear of the recorder. Rotate the On-Off-Volume control #1 clockwise to turn the power on. Adjust Volume control #1 and Volume control #2 so the Level meters will register the same on the loudest passage of sound. Hold Record button down and depress the Play button until both are locked into position. If both buttons will not stay down or a buzzing noise is heard, the tape is not properly threaded.

Hold the microphone approximately eight inches from the mouth when recording voice and two or three feet from the loudspeaker when recording from a radio, phonograph, or TV set.

Hold the Pause button down to interrupt a recording briefly. The recorder will continue to record when the pause button is released.

Head Lifter

Push left lever of head lifter down for four-track recordings, and right lever down for two-track recordings.

To Edit and Splice Tape

Since one track cannot be spliced without affecting the other, recordings to be edited should be limited to one track tapes. Unwanted portions can be cut out and the desired selections joined together. Tapes should be cut at a slight diagonal and the ends joined together with splicing tape on the glossy side. Excess splicing tape should be trimmed from the sides of the tape.

NOTE: Use splicing tape only. Do not use regular cellophane tape.

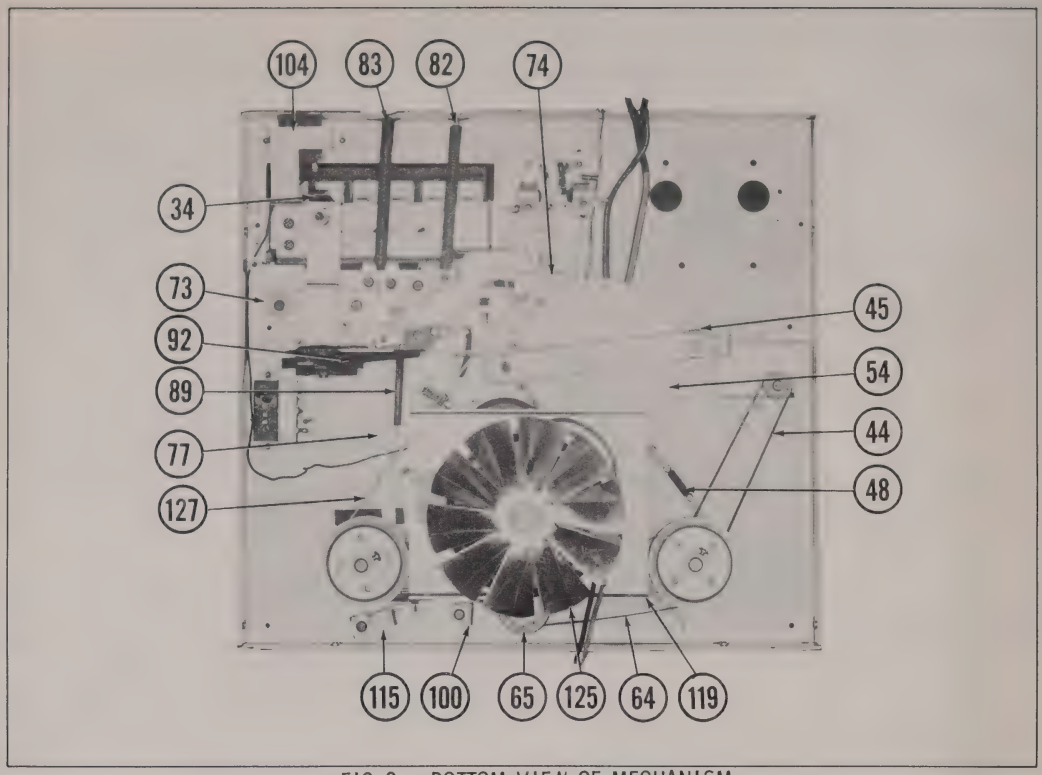


FIG.2 BOTTOM VIEW OF MECHANISM

DISASSEMBLY

To Remove Recorder from Case

1. Remove the escutcheon from the input and output jacks.
2. Remove five screws from bottom of case and four bolts from side.
3. Set case on side and slide the mechanism forward.
4. Reverse foregoing procedure to reassemble.

ADJUSTMENTS

Erase Head

Loosen mounting nuts and set erase head so that top of head gap is even with top of tape. Tighten mounting nuts.

Record-Playback Head

1. Put head in up position by pushing down on left tab of head mounting bracket assembly (42).
2. Loosen mounting nuts at side of head mounting bracket assembly (42). Set top of upper gap even with top of tape. Tighten mounting nuts.
3. Adjust for maximum output by turning alignment screw, on right side of mounting bracket, while playing a prerecorded alignment tape.
4. Repeat steps 2 and 3.

CLEANING

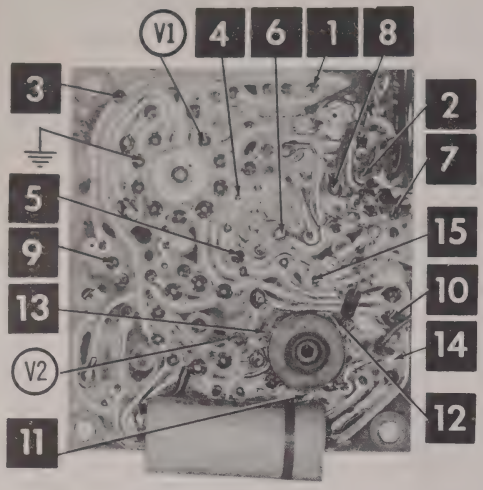
Pressure roller (22), capstan, and recording head (25) should be cleaned occasionally of dirt and foreign matter with a soft cloth moistened with alcohol.

LUBRICATION

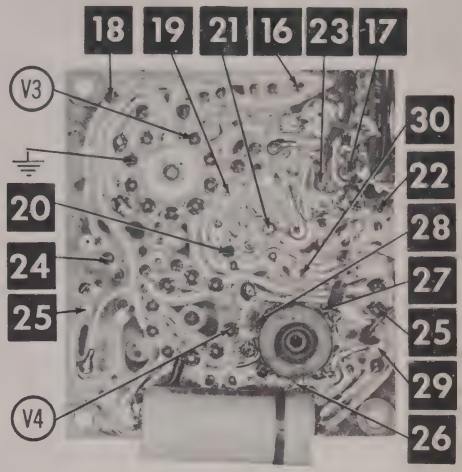
These recorders do not require lubrication under normal use. When disassembled for repair, wipe all bearings and sliding levers with a clean soft cloth and apply a thin coat of oil to their surfaces.

TROUBLE CHART

Symptom	Cause	Remedy
Tape fails to move when Play button is depressed.	1. Worn or dirty pressure roller (22). 2. Supply spindle binds. 3. Not enough pressure to hold pressure roller (22) against flywheel (54). 4. Idler wheel spring (55) weak or missing. 5. Posts of idler arm pivot (56) rusted or plate bent.	1. Clean or replace pressure roller (22). 2. Clean supply spindle or loosen brake cord. 3. Increase tension of back tension spring (72). Pressure should be 16-24 oz. 4. Replace idler wheel spring (55). 5. Clean posts or straighten plate.
Tape fails to move when Wind or Rewind button is depressed.	1. Idler belt(63)slipping or missing. 2. Brakes (127) too tight. 3. Wind or Rewind belts (64) broken or too tight. 4. Idler pulley ass'y. (65) binding.	1. Clean or replace idler drive belt (63). 2. Loosen brake cord (127) from the mounting stud side. 3. Replace wind or rewind belt (64). Idler pulley arm (61) should have 1/16" ± 1/32" travel from left to right in idle position without stretching the belts. 4. Remove idler pulley (65), clean shaft on arm idler pulley ass'y., oil, and replace pulley.
Variation in speed after recorder has been in operation.	1. Pressure roller (22) too tight against flywheel (54). 2. Oil or dirt on flywheel (54), idler wheel (58), idler pulley (65), or motor pulley (124). 3. Wind-Rewind belts (64) too short. 4. Pressure pad springs (16) and (17) too tight.	1. Adjust as mentioned in remedy 3 of first symptom. 2. Clean surfaces of these parts with an industrial cleaner. 3. Adjust idler pulley arm (61) as mentioned in remedy 3 of preceding symptom. 4. Loosen springs by bending anchor back.
No speed change.	1. Speed change bracket (111) arm jumped out of groove of idler arm (75). 2. Speed sliding post gummed up or corroded. 3. Support bracket of idler arm (75) jumped to left of play lever and cam bracket (71).	1. Reposition speed change bracket (111) arm in groove. Tighten lever retainer spring (92). Straighten speed change bracket (111). 2. Clean or replace sliding post and apply a thin film of oil. 3. Bend support bracket (75) down so it will clear top of play lever and cam bracket (71).
Automatic stop does not function.	1. Solenoid arm (104) too far from solenoid.	1. Bend solenoid arm (104) so that there is no more than 1/8" clearance between solenoid arm (104) and solenoid.
Incomplete Erase.	1. Dirty erase head (31). 2. Defective electrical components.	1. Clean erase head (31) with soft cloth and alcohol. 2. Check voltages and resistances. Replace defective part.
Recording weak or distorted.	1. Dirty record-playback head (25). 2. Defective electrical components.	1. Clean record-playback head (25) with a soft cloth and alcohol. 2. Check voltages and resistances. Replace defective part.



CHANNEL 1

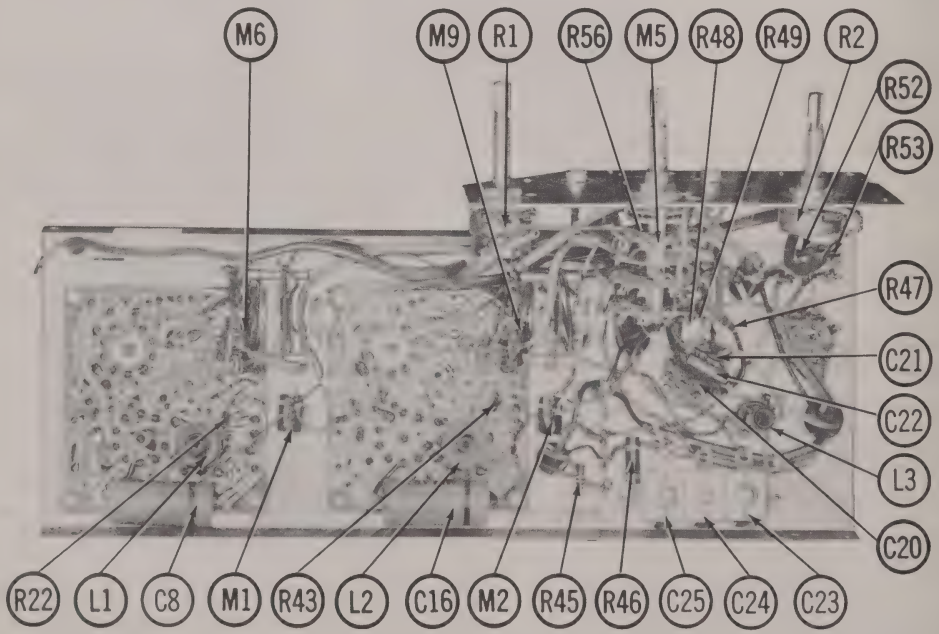


CHANNEL 2

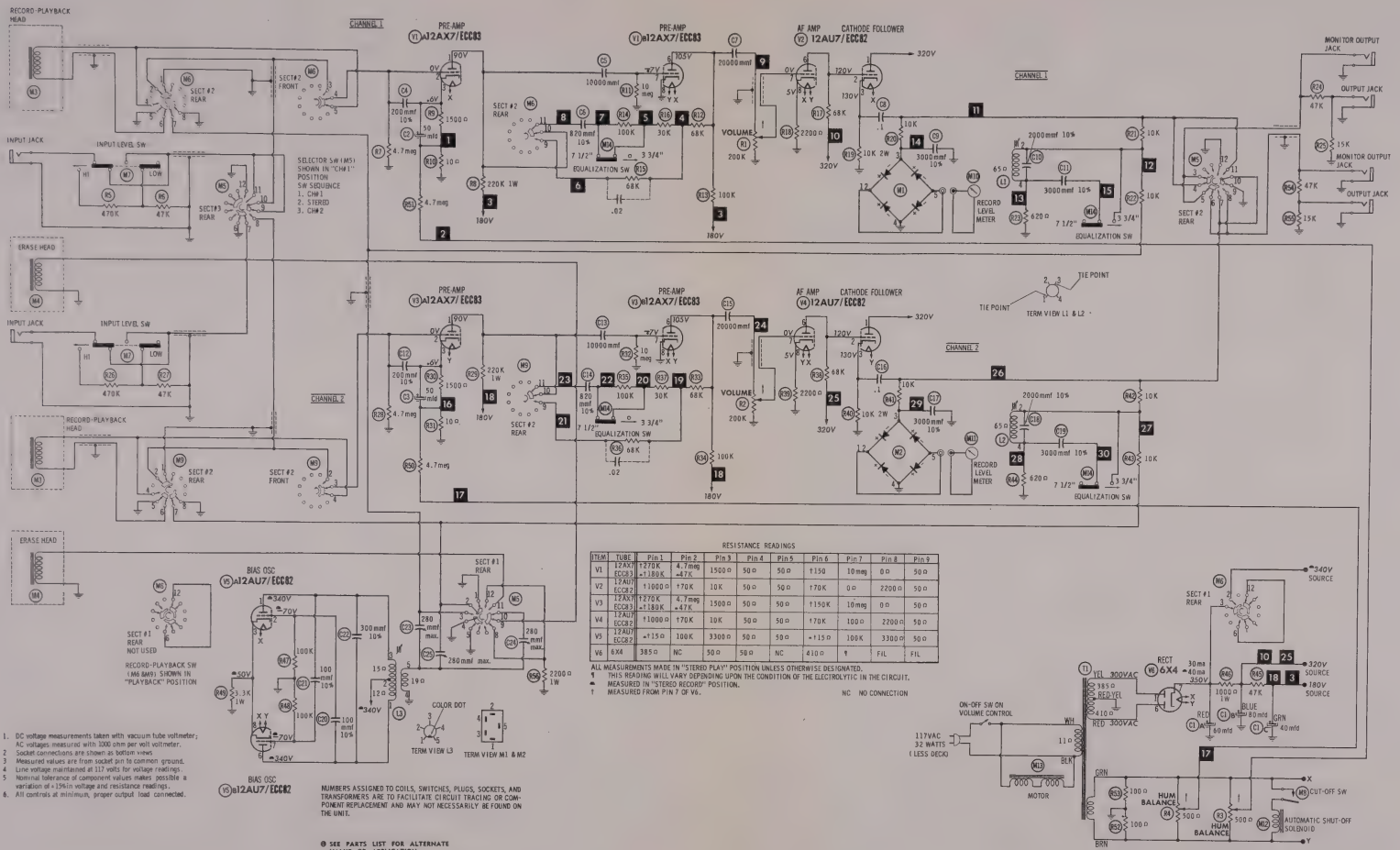
A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARDS

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



CHASSIS-BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7/ECC83	†270K	4.7meg †180K	1500Ω	50Ω	50Ω	†150	10meg	0Ω	50Ω
V2	12AU7/ECC82	†1000Ω	†70K	10K	50Ω	50Ω	†70K	0Ω	2200Ω	50Ω
V3	12AX7/ECC83	†270K	4.7meg †180K	1500Ω	50Ω	50Ω	†150K	10meg	0Ω	50Ω
V4	12AU7/ECC82	†1000Ω	†70K	10K	50Ω	50Ω	†70K	100Ω	2200Ω	50Ω
V5	12AU7/ECC82	▲†15Ω	100K	3300Ω	50Ω	50Ω	▲†15Ω	100K	3300Ω	50Ω
V6	6X4	385Ω	NC	50Ω	50Ω	NC	410Ω	¶	FIL	FIL

ALL MEASUREMENTS MADE IN "STEREO PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
▲ MEASURED IN "STEREO RECORD" POSITION.
† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±10% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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KNIGHT MODEL KN-4060 (92AU774)

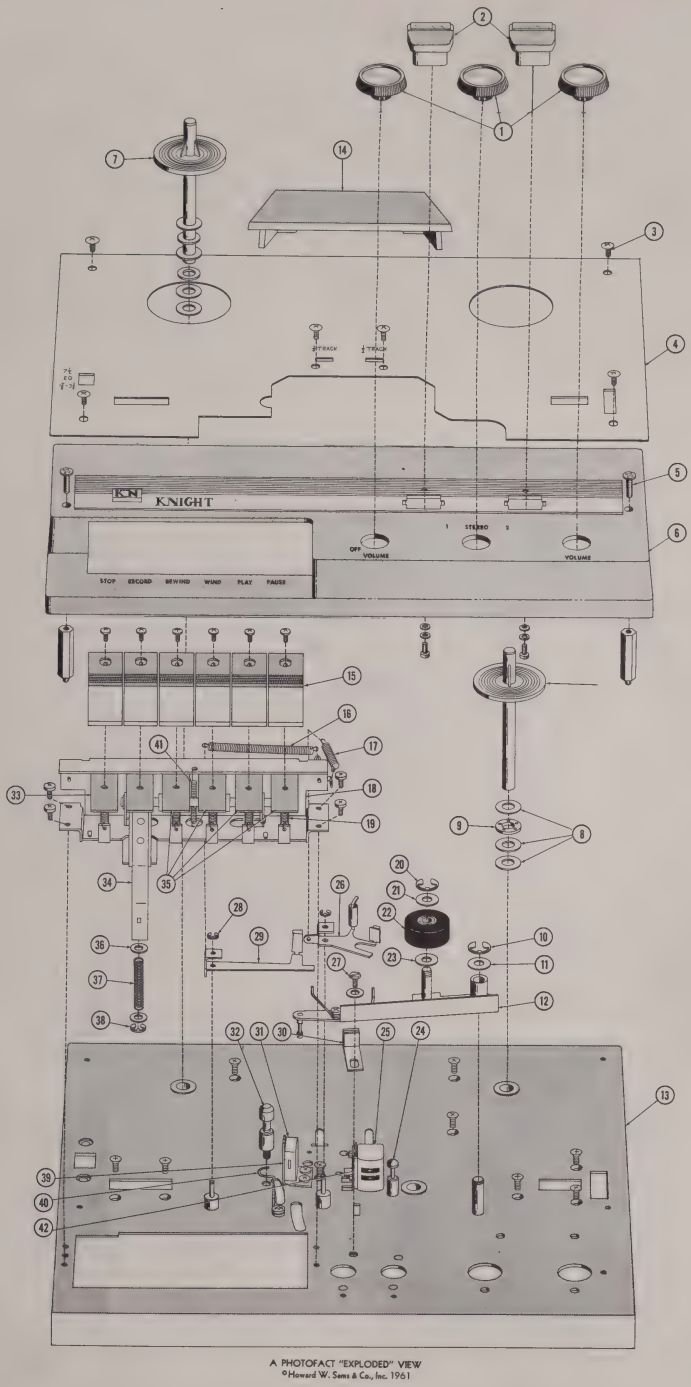


FIG.3A EXPLODED VIEW OF PARTS ABOVE BASE PLATE

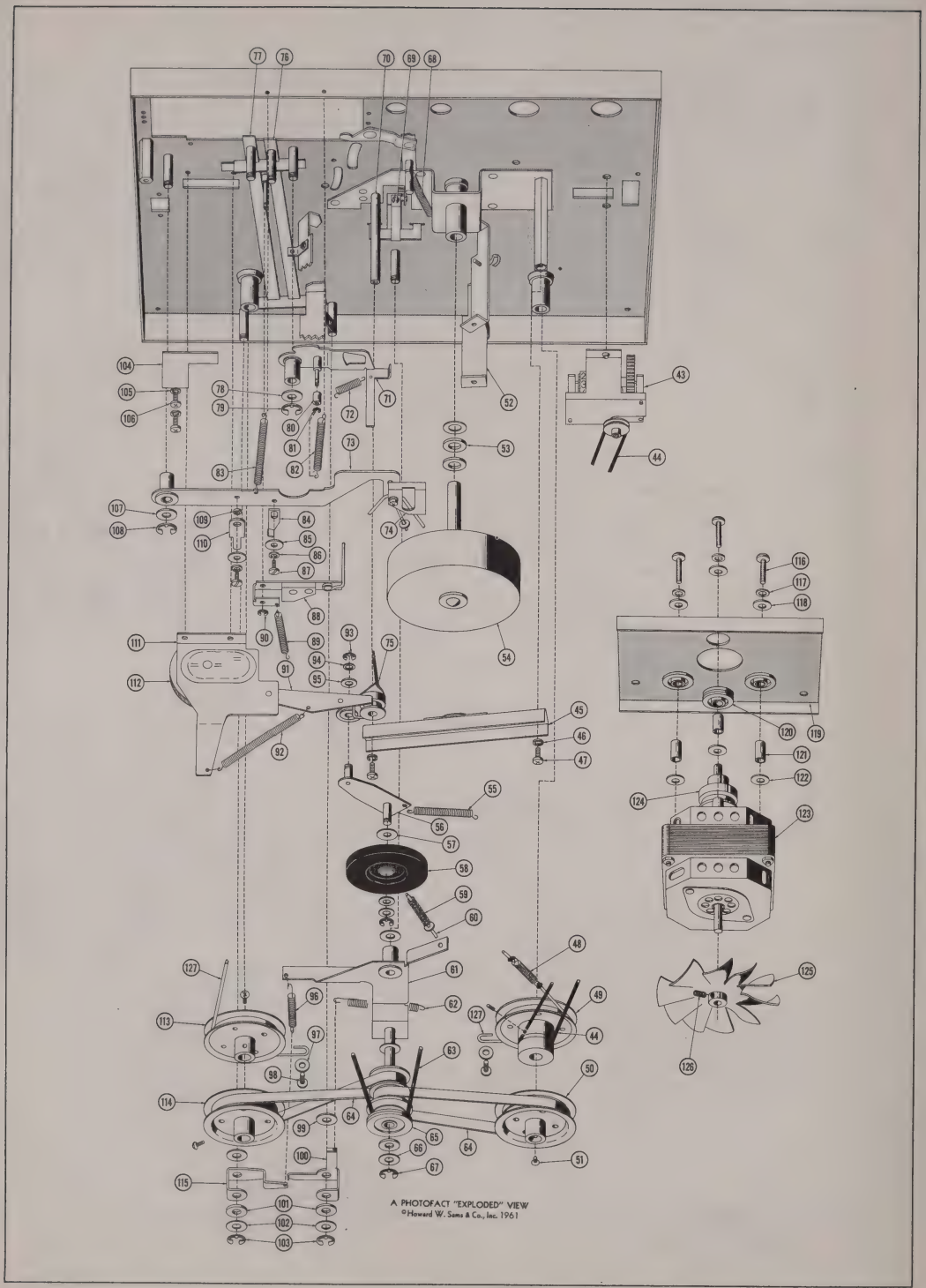


FIG.3B EXPLODED VIEW OF PARTS BELOW BASE PLATE

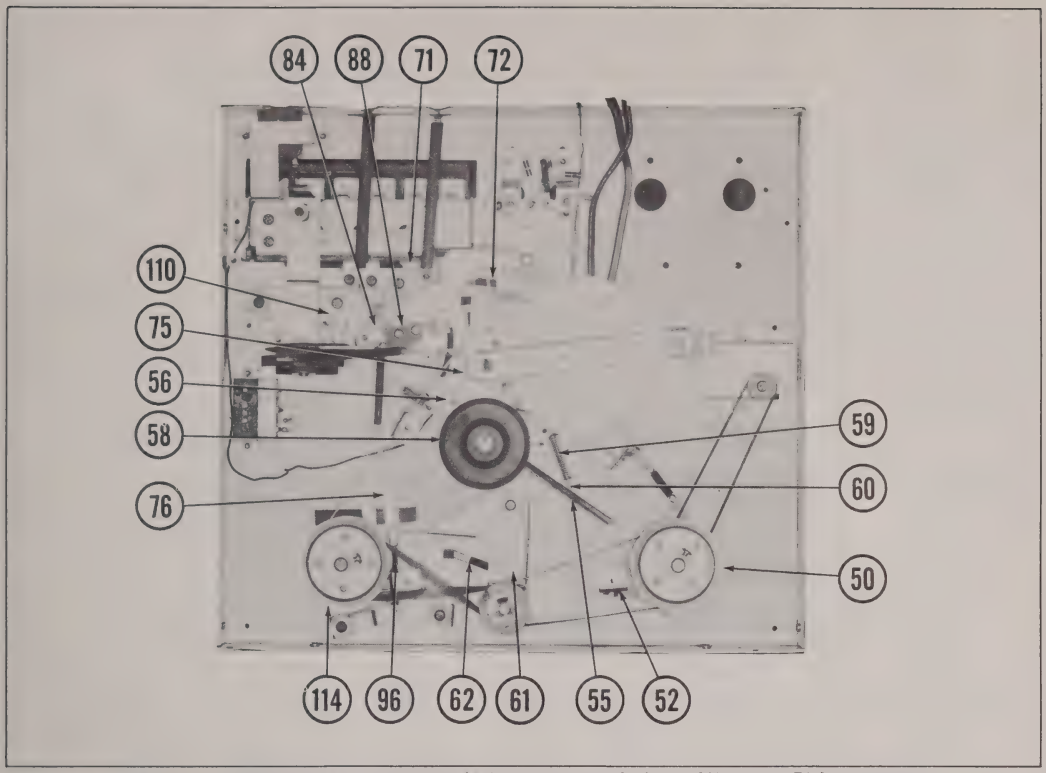


FIG.4 BOTTOM VIEW OF MECHANISM WITH MOTOR MOUNTING PLATE REMOVED

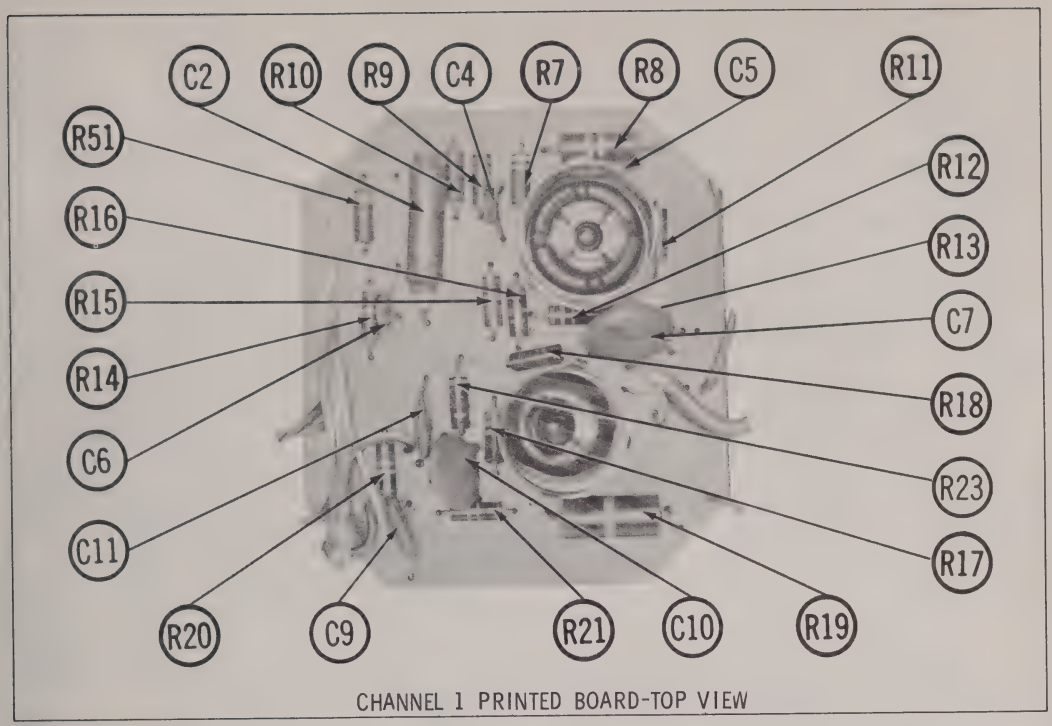
MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1		On-Off-Volume Stereo Knobs	22	TR-1846	Pressure Roller
2		VU Meters	23		Washer
3		Screw, 6-32 x 1/4 Phil. Truss. Hd.	24	TG-476	Right Tape Guide Post
			25	TH-584	Record-Play Head 1/4 Track Stereo
4	TP-1249	Dress Plate			
5		Escutcheon	26	TB-2130	Record Head Pressure Pad Bracket
6		Escutcheon Screw			
7	TS-2152	Spindle	27		Screw, 6 x 3/8 Hex Sheet Metal Type Z
8		Washers			
9		Ball Race	28	5133-12	Retaining Ring
10	5133-25	Retaining Ring	29	TB-2137	Erase Head Pad Bracket
11		Washer .255 I.D. x 1/2 O.D. x .010 Thick Steel	30	TB-1067	Pressure Roller Stop Plate Brkt.
12	TA-1488	Pressure Roller Plate Ass'y.	31		Erase Head - 1/4 Track
13	TB-2151	Motor Board	32	TG-461	Left Tape Guide Post
14	TE-276-3	Rear Escutcheon	33	TL-354-1	Stop Pushbutton Lever
15		Pushbuttons	34	TA-1560	Record Switch Lever
16	TS-1993	Erase Head Pressure Pad Spring	35	TL-354	Pushbutton Lever
			36		Washer .203 I.D. x 3/8 O.D. x 1/32
17	TS-1902	Record Head Pressure Pad Spring	37	TS-1986	Record Switch Spring
18	TA-1349	Pushbutton Ass'y. Bracket	38	5133-18	Retaining Ring
19	TS-1985	Pushbutton Spring	39	TB-2152	Erase Head Bracket
20	5133-25	Retaining Ring	40		Tape Guide Wire
21		Washer, .255 I.D. x 1/2 O.D. x .010	41	TS-1984	Pushbutton Latch Spring
			42	TB-2028	Record-Play Head Mtg. Brkt.

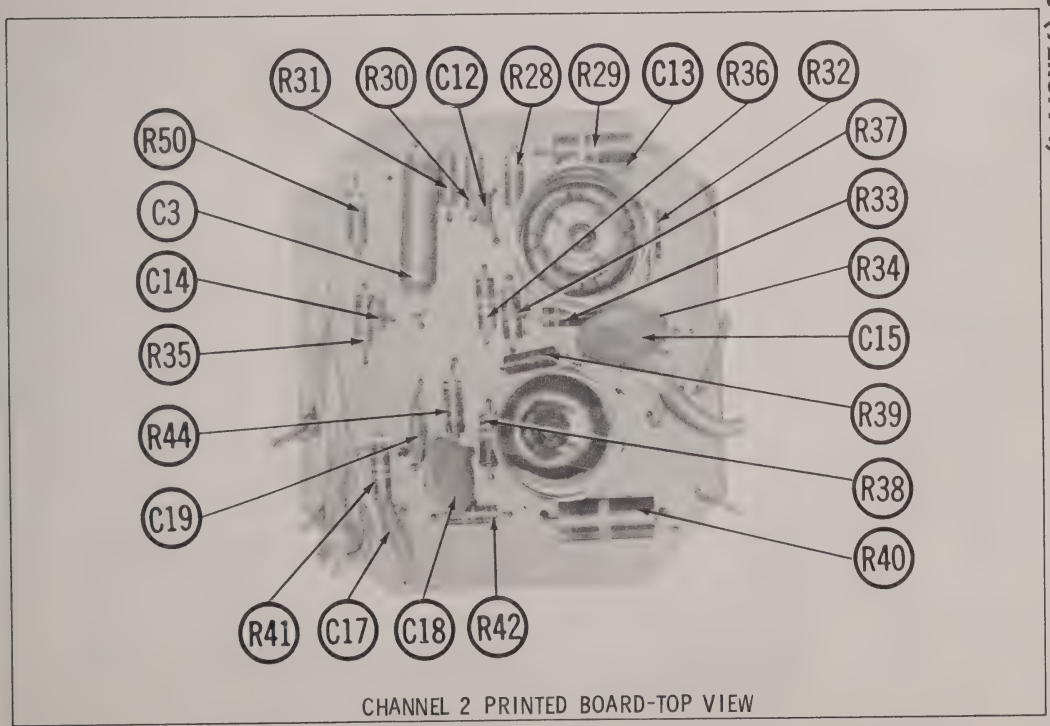
Ref. No.	Part No.	Description
43	TC-1747	Counter Ass'y.
44	TR-1614	Counter Drive Belt
45	TA-1252	Flywheel Thrust Plate Ass'y.
46		No. 6 Lockwasher
47		Screw, 6-32 x 1/2 Phil. Bdg.
48	TS-2085	Brake Cord Spring
49	TA-1183	Counter and Brake Pulley Ass'y.
50	265	Spindle Pulley for Drive Belt
51		Set Screw
52	TB-2180	Motor Mounting Bracket
53		Washer
54	TF-324	Flywheel
55	TS-1993-1	Idler Wheel Spring
56	TA-1174	Idler Arm Pivot Ass'y.
57		Fiber Washer
58*	TW-424*	*Idler Wheel
59	TS-2041	Takeup Compression Spring
60	TA-1225	Idler Release Rod Ass'y.
61	TA-1163	Idler Pulley Arm Ass'y.
62	TS-1981	Wind Spring
63*	TR-1548*	*Idler Drive Belt
64	TB-1018	Wind or Rewind Belt
65	TA-1489	Idler Pulley Ass'y.
66	TW-454	Fiber Thrust Washer
67	5133-25	Retaining Ring
68	TS-1988	Pause Linkage Spring
69	TS-2086	Swivel Head Lifter Shaft
70	TS-1911	Idler Elevation Shaft
71	TA-1176-1	Play Lever and Cam Ass'y.
72	TS-2244	Pressure Roller Tension Spring
73	TA-1173-1	Brake Arm Ass'y.
74	TB-1050	Brake Cord Retainer Bracket
75	TA-1172	Idler Arm Support Speed Change Assembly
76	TR-1615	Push Rod
77	TR-1615	Push Rod
78		Washer
79	5133-25	Retaining Ring
80	TR-1416	Switch Cam Roller
81	5133-12	Retaining Ring
82	TS-2245	Cam Lever Spring
83	TS-1990	Brake Spring
84	TA-1169	Automatic Stop Actuator
85		Washer, 6 x 3/8 x 1/32 Fl. Steel
86		No. 6 Lockwasher
87		Screw, 6-32 x 3/8 Phil. Bdg. Hd. Mach.

Ref. No.	Part No.	Description
88	TA-1170-1	Automatic Shutoff Bracket Ass'y.
89	TS-1993	Automatic Stop Spring
90	5133-12	Retaining Ring
91		Speed Selector Lift Lever (Part of Item 111)
92	TS-1980	Speed Selector Spring
93	5133-18	Retaining Ring
94		Washer, .192 I.D. x 3/8 O.D. x .010 Thick
95		Fiber Washer
96	TS-1981	Rewind Spring
97		Washer, No. 6 I.D. x 7/16
98		Screw, 6 x 3/8 Hex. Sheet Metal Type Z
99		Washer, .225 I.D. x 1/2 O.D. x .010 Thick
100	TL-346	Wind Spring Link
101		Fiber Washer
102		Washer, .225 I.D. x 1/2 O.D. x .010 Thick
103	5133-25	Retaining Ring
104	TL-361	Solenoid Arm Lever
105		Lockwasher
106		Screw
107		Steel Washer
108	5133-25	Retaining Ring
109	TS-2170	Speed Selector Locking Plate Spacer
110	TP-1008	Speed Selector Locking Plate
111	TA-1251	Speed Selector Bracket Ass'y.
112	TC-1741	Speed Selector Wheel
113	TA-1164	Brake Pulley
114	265	Spindle Pulley for Drive Belt
115	TL-367	Rewind Spring Link
116		Motor Mounting Screw
117		Lockwasher
118		Flat Washer
119		Motor Mounting Plate
120		Grommet
121		Spacer
122		Washer
123		Motor
124		Motor Pulley
125		Fan
126		Set Screw
127	TB-1093	Brake Cord, Dacron 24" Long

* Idler Wheel-WALSCO
Part No. 1475
Idler Drive Belt-WALSCO
Part No. 1410-06



CHANNEL 1 PRINTED BOARD-TOP VIEW



CHANNEL 2 PRINTED BOARD-TOP VIEW

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	Channel 1 Preamp.	12AX7/ECC83
V2	Channel 1 AF Amp.	12AU7/ECC82
V3	Channel 2 Preamp.	12AX7/ECC83
V4	Channel 2 AF Amp.	12AU7/ECC82
V5	Bias Oscillator	12AU7/ECC82
V6	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	350	TC-2054	PR4-450	BBRQ0789.5	WT458	CDBQ-4422	TVA-4618	
B	80	300							
C	40	300							
C2	50	3		PTT-3050	NLW50-3	TT6X50	MLV50-3	TE-1058	
C3	50	3		PTT-3050	NLW50-3	TT6X50	MLV50-3	TE-1058	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	200 10%		DI-200	DD-201	L10T2	CCD-201	GP320	10TS-T20
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	820 10%		DI-820	DD-821	5R5T82	CCD-821	GP382	10TS-T82
C7	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C8	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C9	3000 10%		DI-3000		1R5D3	CCD-302	JL-233	10TS-D30
C10	2000 10%		DI-2000		5R5D2	CCD-202	JL-222	10TS-D20
C11	3000 10%		DI-3000		1R5D3	CCD-302	JL-233	10TS-D30
C12	200 10%		DI-200	DD-201	L10T2	CCD-201	GP320	10TS-T20
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	820 10%		DI-820	DD-821	5R5T82	CCD-821	GP382	10TS-T82
C15	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C16	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C17	3000 10%		DI-3000		1R5D3	CCD-302	JL-233	10TS-D30
C18	2000 10%		DI-2000		5R5D2	CCD-202	JL-222	10TS-D20
C19	3000 10%		DI-3000		1R5D3	CCD-302	JL-233	10TS-D30
C20	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C21	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C22	300 10%		1469-0003	TCZ-300	5R5T3	CM-19B-301K	MCB241	MS-33
C23	280max.	#TC-2007				464		
C24	280max.	#TC-2007				464		
C25	280max.	#TC-2007				464		

Knight Part Number.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	200K	½	TP-1352-1	B-51	A47-250K-Z	Q13-130	U44	Volume, Channel 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On
R2A	200K	½	TP-1353-1	B-51	A47-250K-Z	Q13-130	U44	Volume, Channel 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500Ω	½	TP-1152	B-4	A47-500-S	Q11-103	U2	Hum Balance
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R4A	500Ω	½	TP-1152	B-4	A47-500-S	Q11-103	U2	Hum Balance
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	470K			
R6	47K			
R7	4.7meg			
R8	220K 1W			
R9	1500Ω			
R10	10Ω			
R11	10meg			
R12	68K			
R13	100K			
R14	100K			
R15	68K			
R16	30K			
R17	68K			
R18	2200Ω			
R19	10K 2W			
R20	10K			
R21	10K			
R22	10K			
R23	620Ω			
R24	47K			
R25	15K			
R26	470K			
R27	47K			
R28	4.7meg			
R29	220K 1W			
R30	1500Ω			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R31	10Ω			
R32	10meg			
R33	68K			
R34	100K			
R35	100K			
R36	68K			
R37	30K			
R38	68K			
R39	2200Ω			
R40	10K 2W			
R41	10K			
R42	10K			
R43	10K			
R44	620Ω			
R45	47K			
R46	1000Ω 1W			
R47	100K			
R48	100K			
R49	3300Ω 1W			
R50	4.7meg			
R51	4.7meg			
R52	100Ω			
R53	100Ω			
R54	47K			
R55	15K			
R56	2200Ω 1W			

COILS (RF-IF)

ITEM No.	USE	KNIGHT PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	Equalizer	TC-1947					
L2	Equalizer	TC-1947					
L3	Bias Osc.	TC-1937					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	KNIGHT PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V @ .3A	600VCT @ .040A DC	6.3V @ 2.3A	TT-770		PC-8406 ①			① Drill New Mounting hole(s).

SIGNAL DIODES

ITEM No.	ORIG. TYPE	KNIGHT PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M1		TR-2005 *				* Meter Rect. Bridge
M2		TR-2005 *				

ELECT. PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M3	Head	TH-584	Record-Playback
M4	Head	TH-590	Erase
M5	Switch	TS-3016-1	Function Selector (Rotary Type)
M6	Switch	TS-2223	Playback-Record (Rotary Type) Channel 1
M7	Switch	TS-2249	Level (4PDT Slide Type)
M8	Switch	TS-1999	Cutoff (Leaf Type)
M9	Switch	TS-2223	Play-back -Record (Rotary Type) Channel 2
M10	VU Meter	TM-461	Channel 1
M11	VU Meter	TM-461	Channel 2
M12	Solenoid	TC-1783-1	Automatic Shutoff
M13	Motor & Flywheel Assembly	TA-1462	
M14	Switch		Equalization (7½" - 3 3/4")

CABINETS & CABINET PARTS

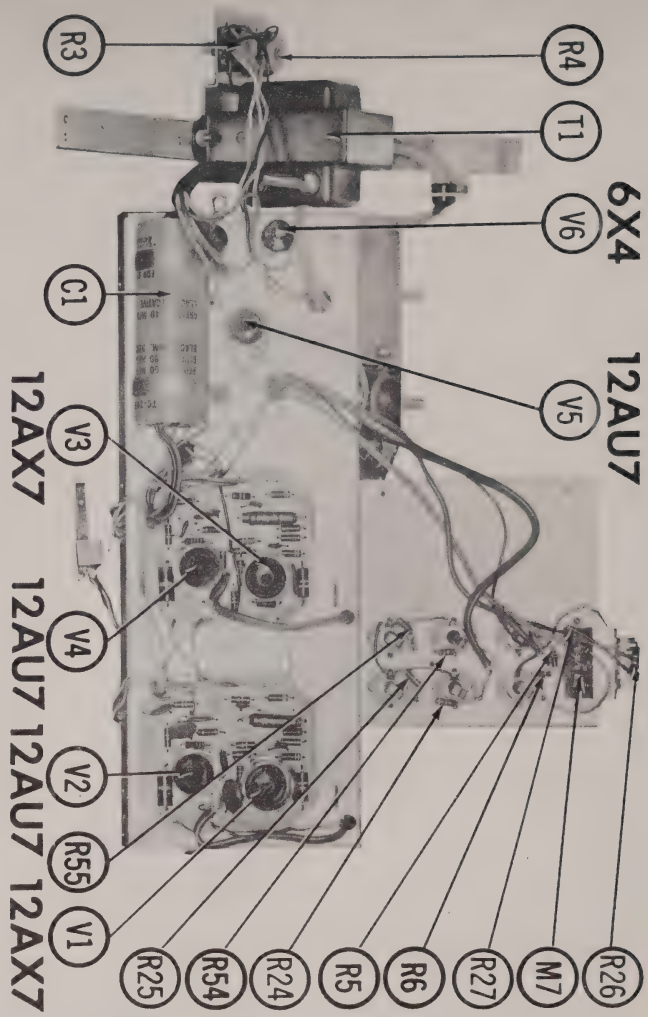
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	TK-276	
Pushbutton	TB-1010	
Cabinet	TC-2156	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

ELECT. CHASSIS—TOP VIEW



PHOTOFACT® Folder

LAFAYETTE
MODELS HE-15, HE-16, HE-18

LAFAYETTE
MODELS HE-15, HE-16, HE-18

MODEL HE-15

LAFAYETTE
MODELS HE-15, HE-16, HE-18

TRADE NAME	LaFayette Models HE-15, HE-16, HE-18 (External DC Power Supply)		
SUPPLIER	LaFayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.		
TYPE SET	6 Tube Citizens Band Transmitter-Receiver		
POWER SUPPLY	105 — 125 Volts AC, 60 Cycles 6 Volt Storage Battery 12 Volt Storage Battery	RATING	40 Watts, .4 Amp. @117 Volts AC 5.3 Amp. @6.3 Volts DC 2.6 Amp. @12.6 Volts DC
FREQ. RANGE	TRANSMITTER: Any 5 of Citizens Band Channels 1 thru 22. RECEIVER: Continous Tuning		

NOTICE

ONLY THOSE PERSONS PROPERLY LICENSED BY FCC ARE PERMITTED TO MAKE CRYSTAL SUBSTITUTION OR EFFECT REPAIRS ON THE TRANSMITTER PORTION OF THIS UNIT.

SET 537 FOLDER 10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KZ511

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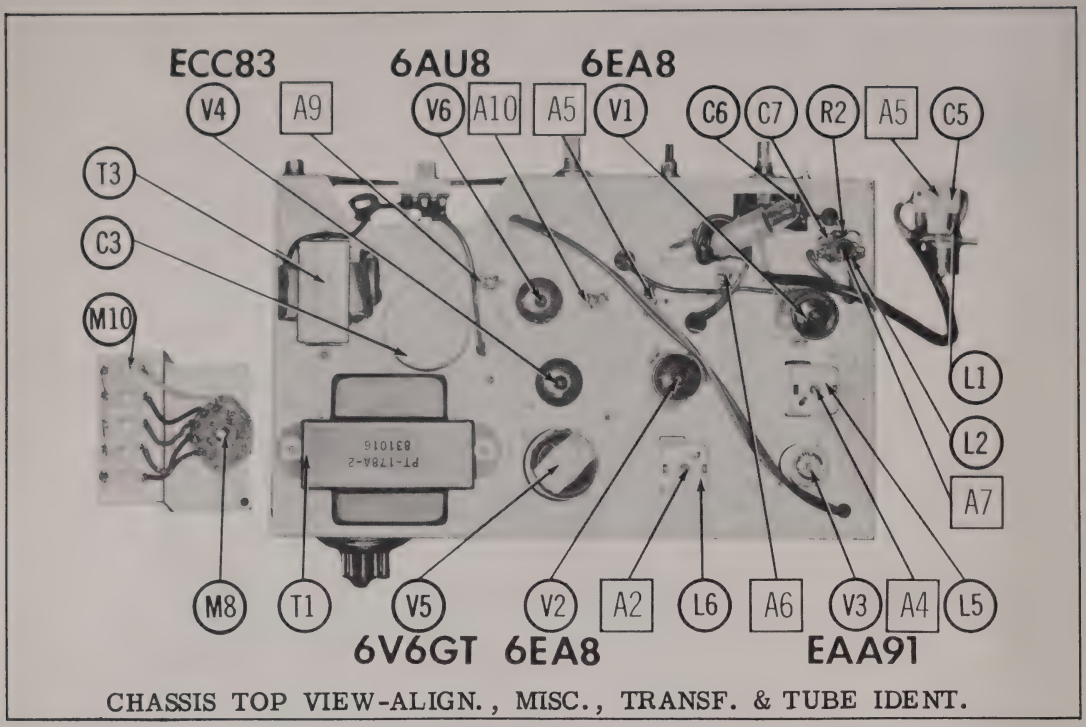
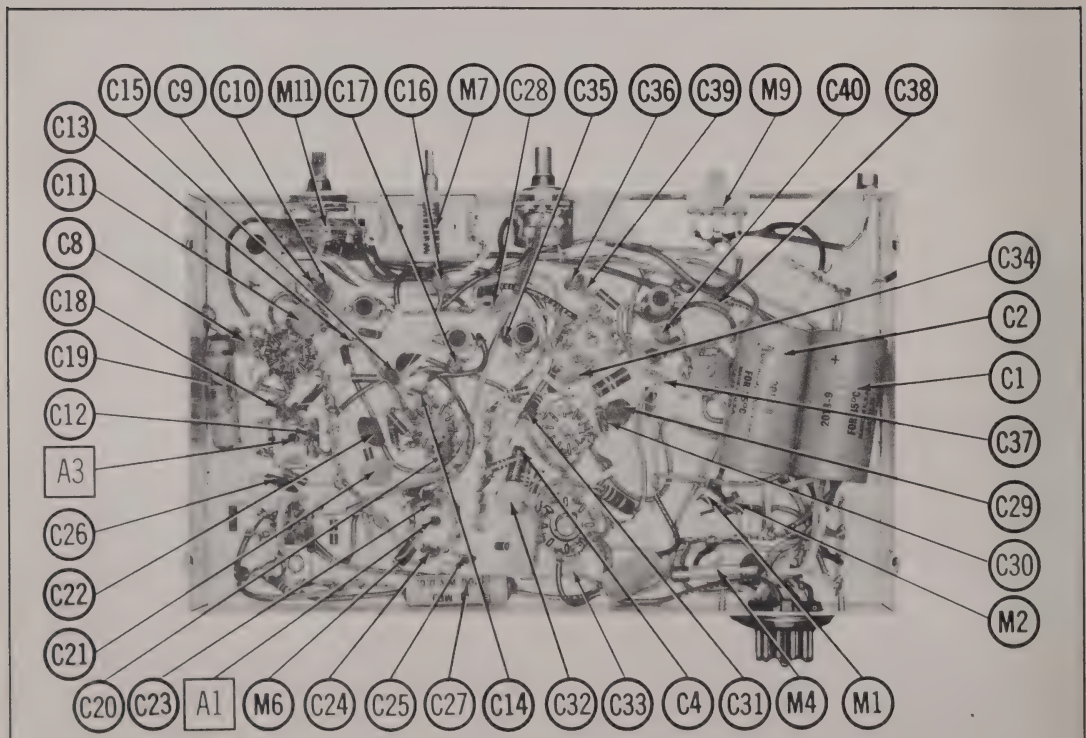


CHASSIS TOP VIEW-ALIGN., MISC., TRANSF. & TUBE IDENT.



CHASSIS BOTTOM VIEW-ALIGN., CAP. & MISC. IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

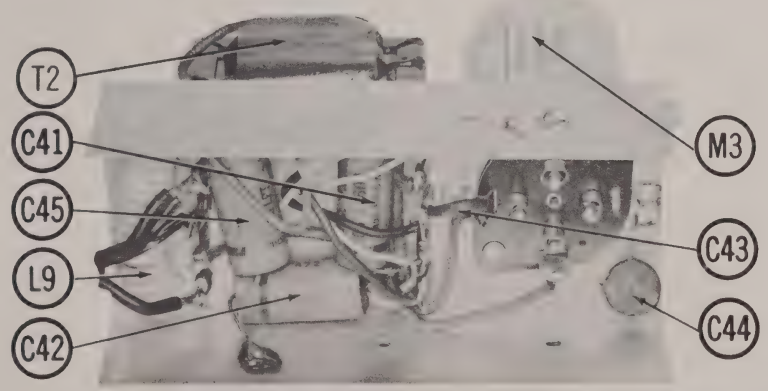
Suggested Alignment Tools:
A1 thru A4..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A8..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

RECEIVER ALIGNMENT

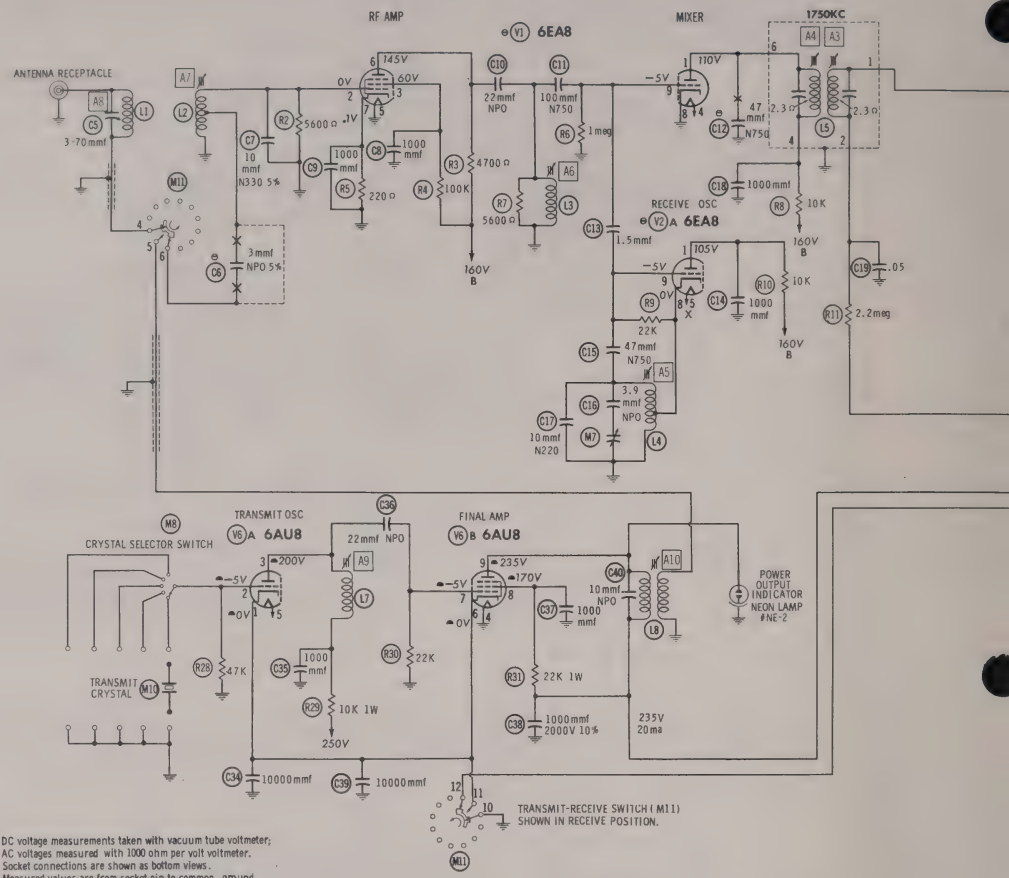
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to pin 9 (grid) of Mixer. Low side to chassis.	1750KC (400% Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side thru 270mmf to antenna receptacle. Low side to chassis.	Channel 11 Freq.	Channel 11	"	A5	Adjust until signal is received.
3.	"	"	"	"	A6, A7	Adjust for maximum output.
4.	If television interference occurs, adjust A8 for MINIMUM interference.					

TRANSMITTER ALIGNMENT

5.	NOT USED			USE VTVM DC probe to pin 7 (grid) of Final. Common to chassis.	A9	Depress transmit button and adjust A9 for maximum deflection.
6	NOT USED				A10	Depress transmit button and adjust A10 for maximum brightness of Power Output Indicator light.



POWER CHASSIS



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6EA8	†15K	.1Ω	†100K	0Ω	.1Ω	†10K	220Ω	0Ω	1meg
V2	6EA8	†15K	2meg	†15K	0Ω	.1Ω	†15K	100Ω	0Ω	22K
V3	EAA91	1.5meg	600K	.1Ω	0Ω	1.5meg	0Ω	600K ▪ 1meg	FIL	FIL
V4	ECC83 12AX7	▲†470K	4.7meg	0Ω	.1Ω	.1Ω	†22K	470K	3300Ω	0Ω
V5	6V6GT	0Ω	1Ω	†630Ω	†330Ω	470K	TP	0Ω	470Ω	FIL
V6	6AU8	▲0Ω	47K	†10K	.1Ω	0Ω	▲0Ω	22K	▲†22K	▲†710Ω

ALL MEASUREMENTS MADE IN "RECEIVE" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "TRANSMIT" POSITION.
▪ MEASURED WITH NOISE LIMITER IN "OFF" POSITION.
† MEASURED FROM OUTPUT OF M1.
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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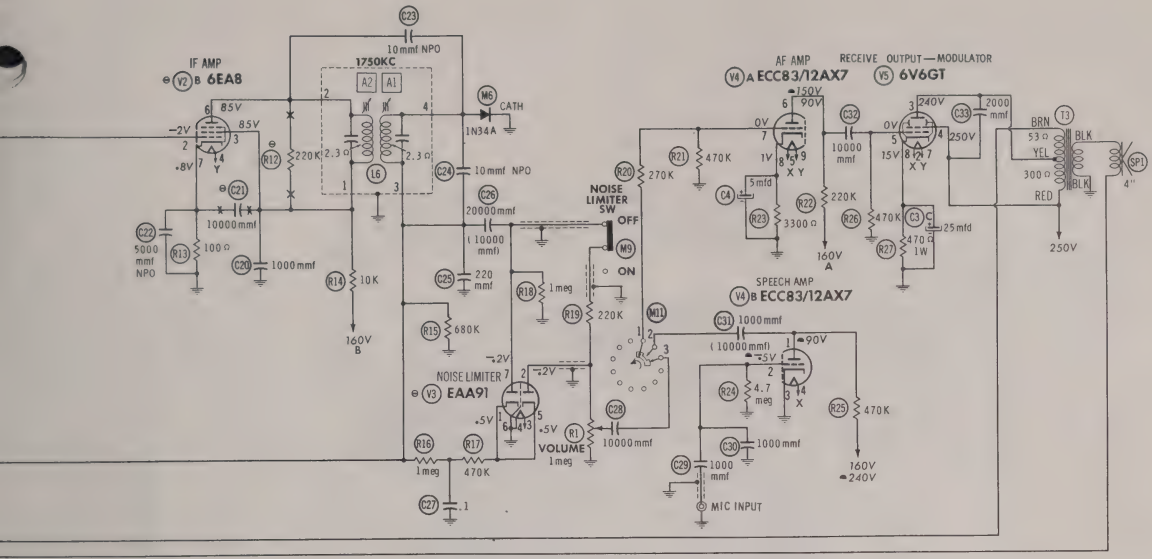
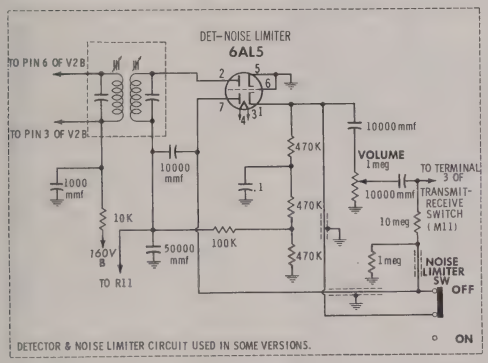
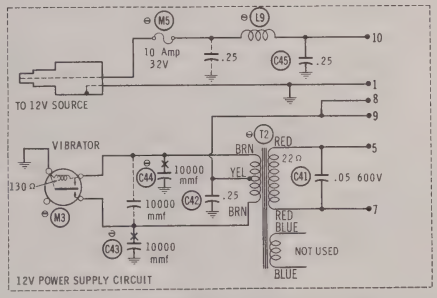
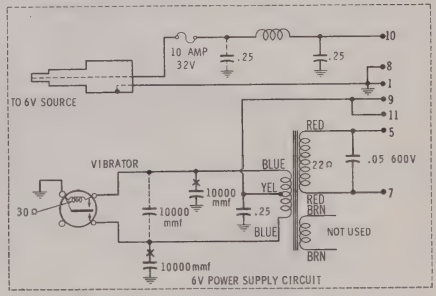
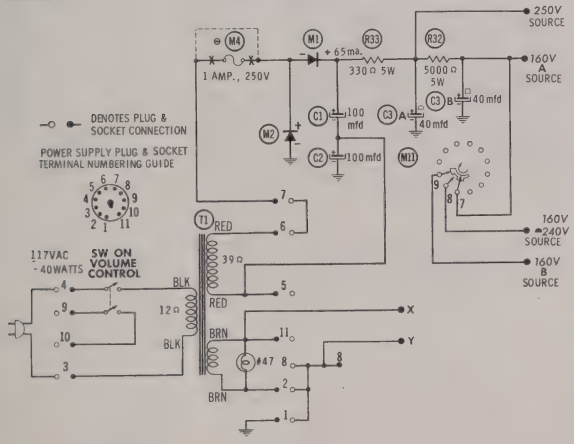










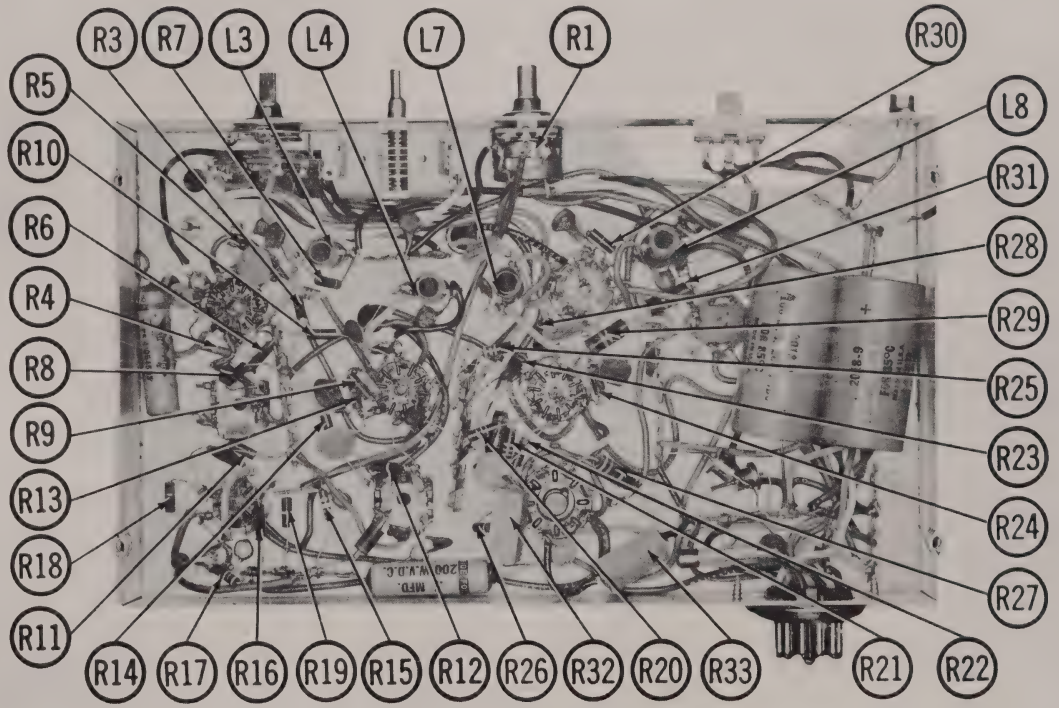
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

LAFAYETTE
MODELS HE-15, HE-16, HE-18



CHASSIS BOTTOM VIEW-INDUCTOR & RESISTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC / RAYTHEON / SYLVANIA)
V1	RF Amp.-Mixer	6EA8 (6U8A) *
V2	Rec. Osc.-IF Amp.	6EA8 (6U8A) *
V3	Det.-Noise Limiter	EAA91 (6AL5) *
V4	AF Amp.-Speech Amp.	ECC83/12AX7
V5	Rec. Output-Modulator	6V6GT
V6	Trans. Osc.-Final Amp.	6AU8

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	LAFAYETTE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	100	200		PRS1595	BRL0035	TC1265	TD-100-200	TVA-1718	
C2	100	200		PRS1595	BRL0035	TC1265	TD-100-200	TVA-1718	
C3A	40	350		AFH3-140-50	C0870	FP367.5	TMT-3367	TVL-3754.5	
B	40	350							
C	25	25							
C4	5	10		PTT-10005	NLW5-15	TT12X5	MLV5-12	TE-1127	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	3-70					462		
C6	3 NPO 5%	Note 1	NPO-SI 3.0	TCZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C7	10 N330 5%			TCA-10		*		10TCS-Q10
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C10	22 NPO		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C11	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C12	47 N750	Note 1	N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C13	1.5		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C14	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C15	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CNO-447	10TCU-Q47
C16	3.9 NPO				C10V4C			10TCC-V39
C17	10 N220					*		10TCR-Q10
C18	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C19	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C20	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C21	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C23	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C24	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C25	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C26	20000	(10000) †	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C27	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C30	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C31	1000	(10000) †	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C36	22 NPO		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C37	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C38	1000 2000V 10%							
C39	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C40	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C41	.05 600V		P608N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S50
C42	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C43	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25

Note 1. Not used in some versions.
† Alternate Value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	LAFAYETTE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	1/2	V329-3	B-70-S	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-20	76-2	US-27	Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	5600Ω			
R3	4700Ω			
R4	100K			
R5	220Ω			
R6	1meg			
R7	5600Ω			
R8	10K			
R9	22K			
R10	10K			
R11	2.2meg			
R12	220K			Note 1
R13	100Ω			
R14	10K			
R15	680K			
R16	1meg			
R17	470K			

ITEM No.	RATING	IRC PART No.	WORKMAN TV PART No.	REMARKS
R18	1meg			
R19	220K			
R20	270K			
R21	470K			
R22	220K			
R23	3300Ω			
R24	4.7meg			
R25	470K			
R26	470K			
R27	470Ω 1W			
R28	47K			
R29	10K 1W			
R30	22K			
R31	22K 1W			
R32	5000Ω 5W	PW5-5000	5W-SQ-5000	
R33	330Ω 5W	PW5-330	5W-SQ-330	

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	LAFAYETTE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	Ant. Loading						① Used in Battery operated units only.
L2	Ant.						
L3	RF		TV-118	6171-A	RTC-8609	T216	
L4	Osc.						
L5	1st IF						
L6	2nd IF						
L7	Osc. Plate		TV-118	6171-A	RTC-8609	T216	
L8	Final Output						
L9	Hash Choke	①					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	LAFAYETTE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V@ .4A	110V@ .2A	6.3V@ 2.3A	PT-178A-2					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	LAFAYETTE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6.3V CT @ 3A(or) 12.6VCT @ 1.5A	110V@ .2A	22V (Not Used) ①	VT-181-2 ②					① Secondary 2 is 10 Volts on 12 Volt operation. ② Specify for 6 or 12 volt DC operation

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	LAFAYETTE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	5200Ω Tap @ 5000Ω	3-4Ω	T-179-2		A-3817			

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	LAFAYETTE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	S7171 (7896144A)	4A07	

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	LAFAYETTE PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.065A		1N1763	40H	SR500	
M2	.065A		1N1763	40H	SR500	

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				LAFAYETTE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M3	Interrupter	6.3V	115		5301	1601	5301	6 Volt Versions
	Interrupter	12.6V	115		6301	G1601	6301	12 Volt Versions

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			LAFAYETTE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	3AG	1A 250V P/T			318001 (3AG 1A 250V P/T		GJV-1	
M5	3AG	10A 32V	Note 1		312010 (3AG 10A 32V)	155020	AGC-5	HDJ

Note 1. For DC Operation Only.

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		LAFAYETTE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M6	1N34A			1N34A	1N34A	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	LAFAYETTE PART No.	NOTES
M7	Variable Cap.		Receiver Oscillator
M8	Switch		Crystal Selector
M9	Switch		Noise Limiter (SPDT Slide Type)
M10	Crystal		Transmit
M11	Switch		Receive-Transmit
	Antenna		Model HE-17

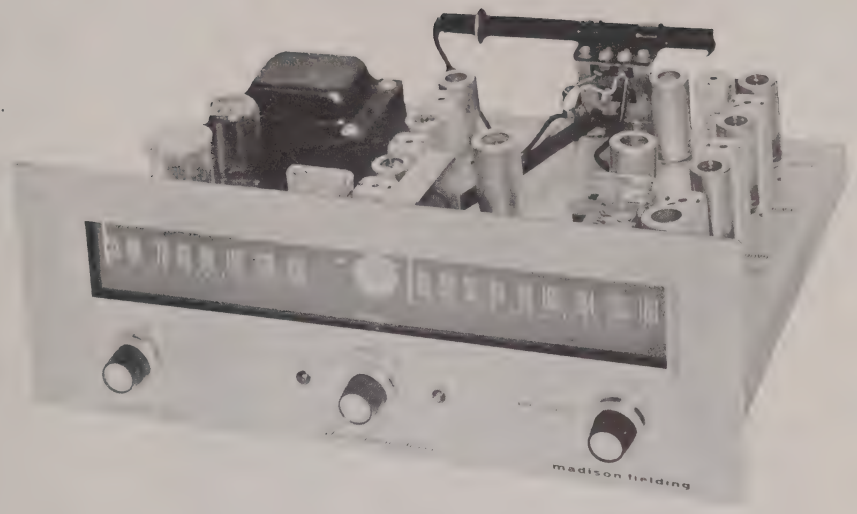
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT® Folder

**MADISON FIELDING
MODEL SERIES 380**

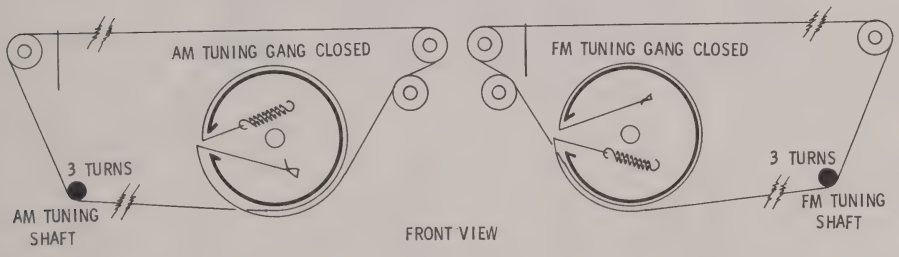
MADISON FIELDING
MODEL SERIES 380



MADISON FIELDING
MODEL SERIES 380

TRADE NAME	Madison Fielding Model Series 380		
MANUFACTURER	Crosby Electronics, Inc., Subsidiary of Crosby-Teletronics Corp., 135 Eileen Way, Syosset, L.I., New York		
TYPE SET	AC Operated 13 Tube FM-AM Tuner		
POWER SUPPLY	105-125 Volts AC, 50-60 Cycles	RATING	70 Watts, .65 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 540 - 1600KC	FREQ. MOD.	88 - 108MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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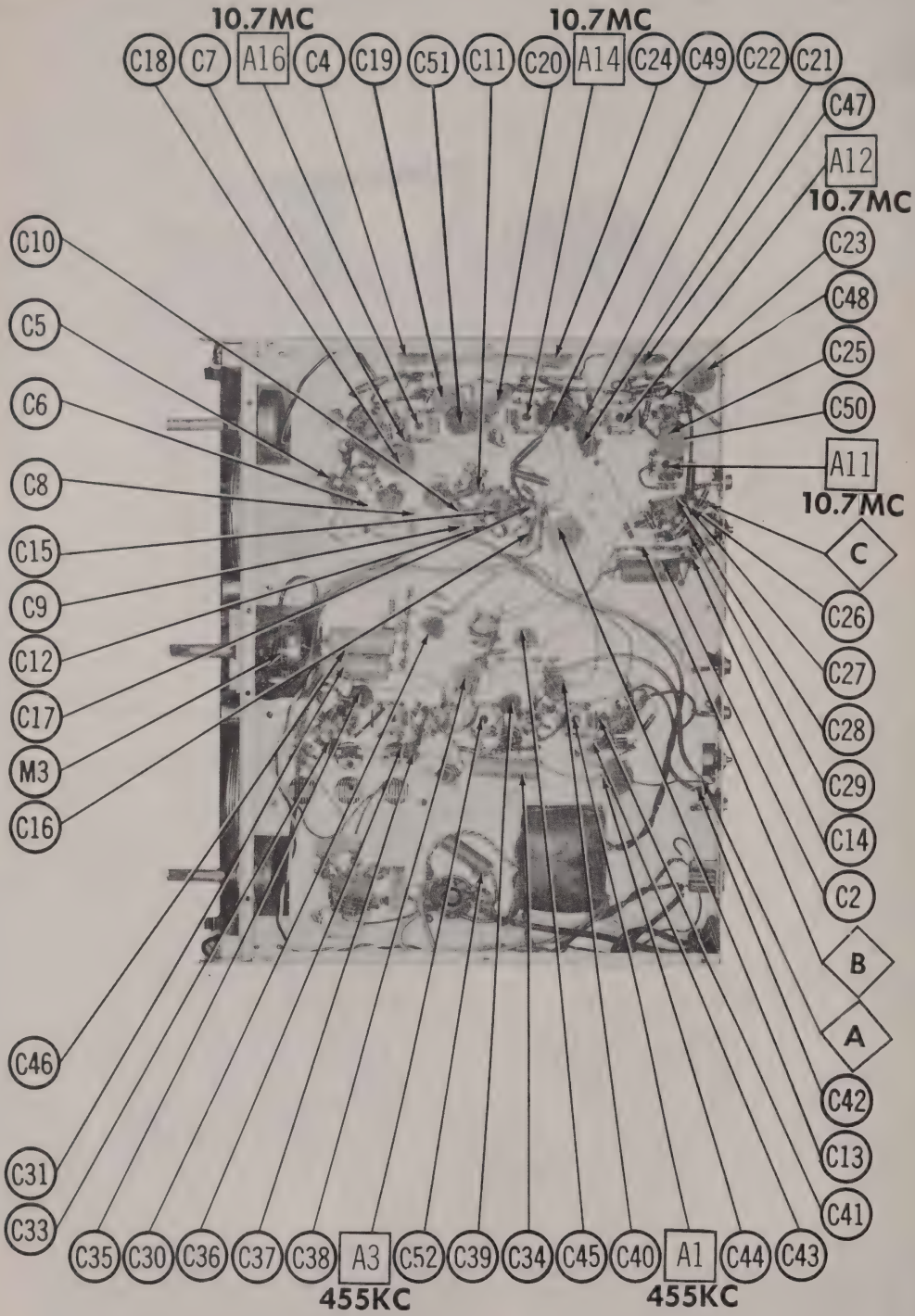
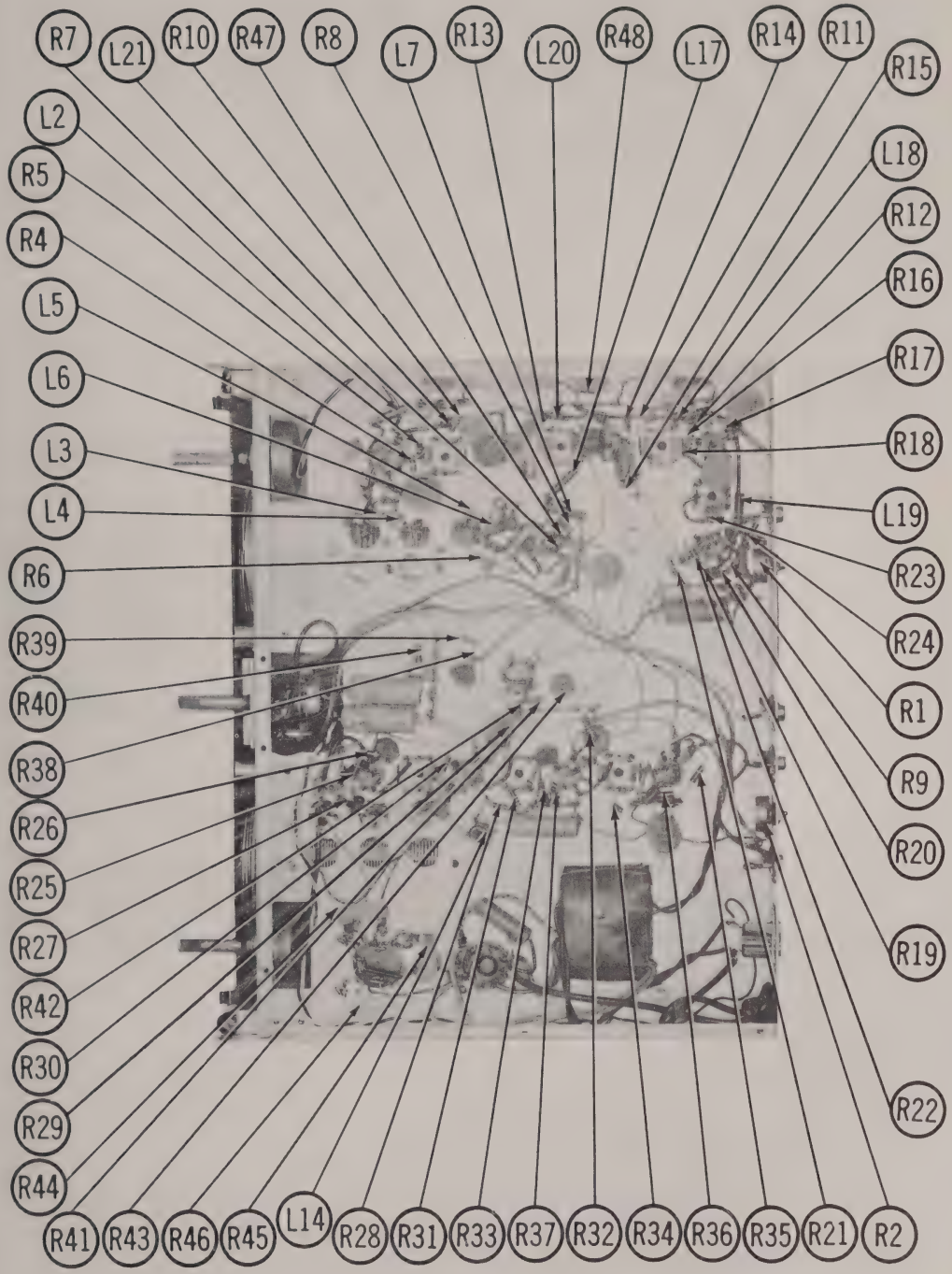
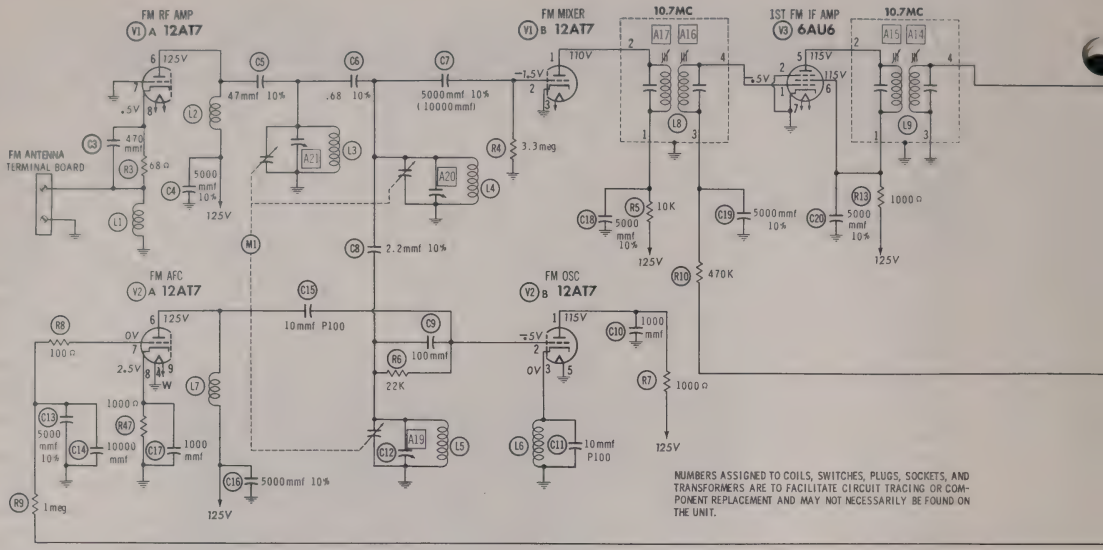
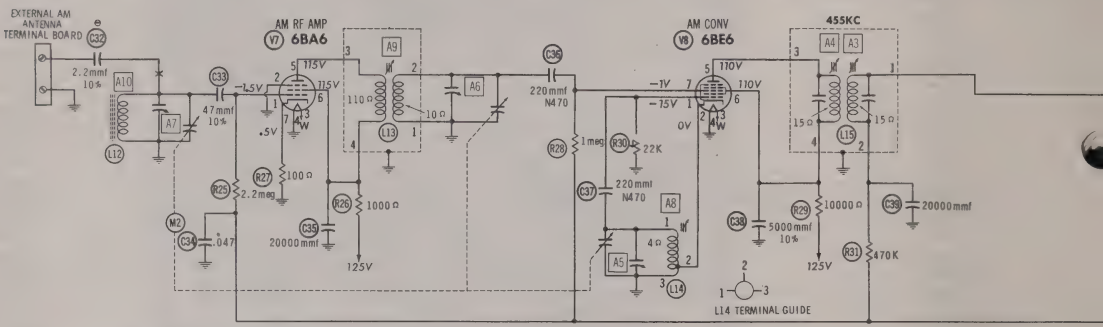


CHASSIS BOTTOM VIEW-ALIGN., CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.


FM RF AMP
V1 A 12AT7
FM MIXER
V1 B 12AT7
10.7MC
1ST FM IF AMP
V3 6AU6
10.7MC
FM ANTENNA TERMINAL BOARD
FM AFC
V2 A 12AT7
FM OSC
V2 B 12AT7
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	†12K	3.3meg	0Ω	0Ω	0Ω	†2500Ω	0Ω	68Ω	.1Ω
V2	12AT7	†3500Ω	22K	0Ω	0Ω	0Ω	†2500Ω	1.5meg	1000Ω	.1Ω
V3	6AU6	1meg	0Ω	0Ω	.1Ω	†3500Ω	†3500Ω	0Ω	FIL	FIL
V4	6AU6	.1Ω	0Ω	0Ω	.1Ω	†4500Ω	†4500Ω	100Ω	FIL	FIL
V5	6AU6	100K	0Ω	0Ω	.1Ω	†21K	†21K	100Ω	FIL	FIL
V6	6AL5	7800Ω	8300Ω	.1Ω	0Ω	600K	0Ω	600K	FIL	FIL
V7	6BA6	5.6meg	0Ω	.1Ω	0Ω	†3500Ω	†3500Ω	100Ω	FIL	FIL
V8	6BE6	22K	.3Ω	.1Ω	0Ω	†3500Ω	†3500Ω	4.5meg	FIL	FIL
V9	6BA6	3.4meg	0Ω	.1Ω	0Ω	†20K	†20K	68Ω	FIL	FIL
V10	6AL5	0Ω	950K	.1Ω	0Ω	0Ω	0Ω	2.2meg	FIL	FIL
V11	6AF6G	NC	.1Ω	†20K	†120K	†2500Ω	NC	0Ω	0Ω	FIL
V12	12AU7	†2500Ω	0Ω	50K	.1Ω	.1Ω	†2500Ω	0Ω	50K	0Ω
V13	5Y3GT	NC	¶ INF	NC	105Ω	TP	100Ω	NC	¶ INF	FIL

ALL MEASUREMENTS MADE IN "STEREO" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
⏚ MEASURED FROM CATHODE.
† MEASURED FROM PIN 8 OF V13.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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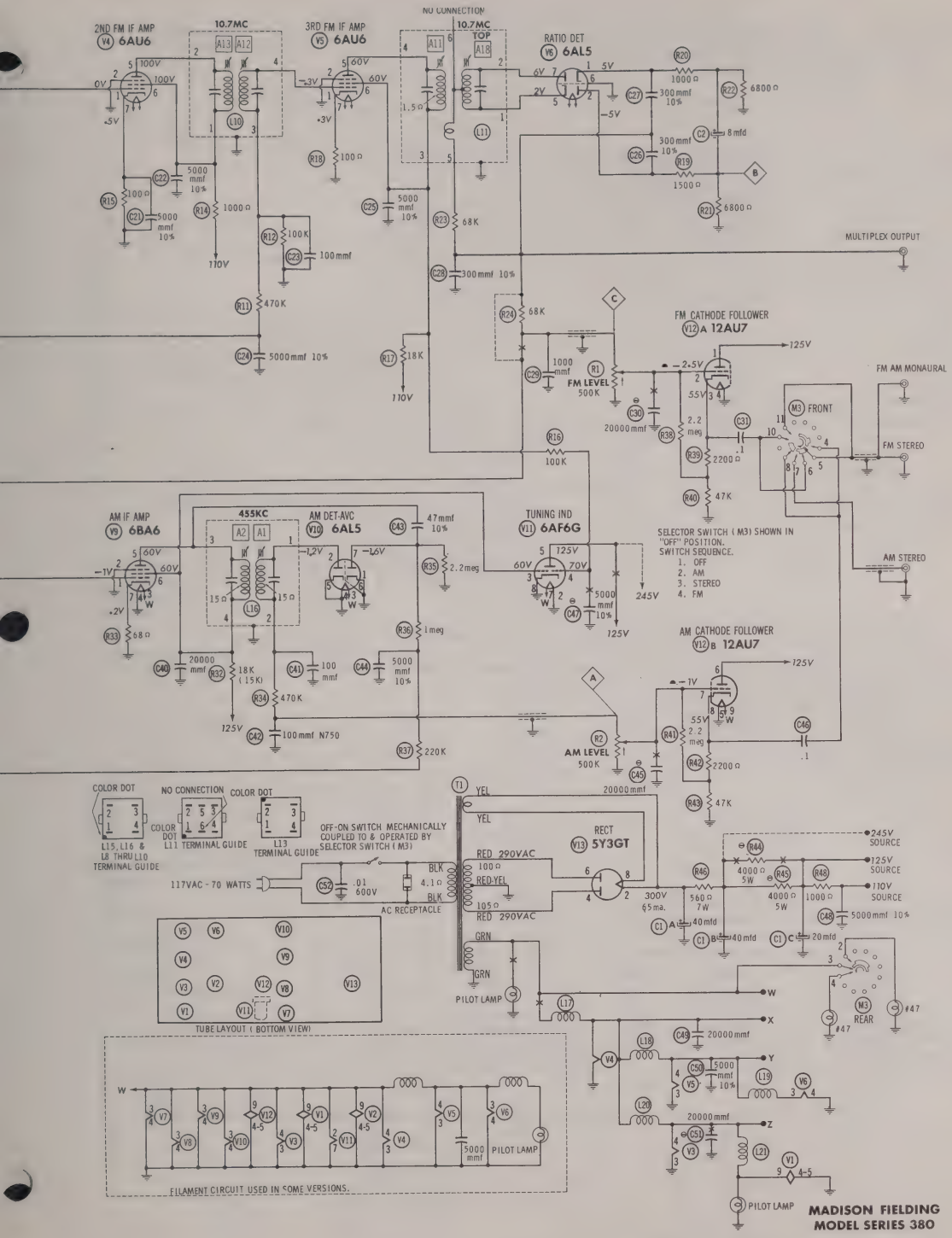

2ND FM IF AMP
V4 6AU6
10.7MC
3RD FM IF AMP
V5 6AU6
NO CONNECTION
10.7MC TOP
RATIO DET
V6 6AL5
MULTIPLEX OUTPUT
FM CATHODE FOLLOWER
V12A 12AU7
FM LEVEL 500K
FM AM MONAURAL
FM STEREO
AM STEREO
M3 FRONT
AM IF AMP
V9 6BA6
455KC
AM DET-AVC
V10 6AL5
TUNING IND
V11 6AF6G
SELECTOR SWITCH (M3) SHOWN IN "OFF" POSITION.
SWITCH SEQUENCE.
1. OFF
2. AM
3. STEREO
4. FM
AM CATHODE FOLLOWER
V12B 12AU7
AM LEVEL 500K
COLOR DOT
NO CONNECTION
L15, L16 & L8 THRU L10 TERMINAL GUIDE
L11 TERMINAL GUIDE
L13 TERMINAL GUIDE
OFF-ON SWITCH MECHANICALLY COUPLED TO & OPERATED BY SELECTOR SWITCH (M3)
117VAC - 70 WATTS
AC RECEPTACLE
RECT
V13 5Y3GT
RED 290VAC
RED-YEL
GRN
PILOT LAMP
245V SOURCE
125V SOURCE
110V SOURCE
M3 REAR
#47
TUBE LAYOUT (BOTTOM VIEW)
FILAMENT CIRCUIT USED IN SOME VERSIONS.
MADISON FIELDING
MODEL SERIES 380

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:
- A1 thru A4, A8, A11 thru A18 ... GENERAL CEMENT #5097, 8727; WALSCO #2515
- A5, A6, A7, A19, A20, A21 ... GENERAL CEMENT #5004, 5008, 5009; WALSCO #2520
- A9 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295, 9440; WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT - SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis	455KC (400∿ 30% AM)	(AM) Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	1400KC	1400KC	"	A5, A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	600KC	600KC	"	A8, A9, A10	Adjust for maximum deflection. Repeat steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM - SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .001mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference	DC probe to point Ⓑ. Common to chassis.	A11, A12, A13, A14, A15, A16, A17	Adjust for maximum deflection.
5.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A18	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE - SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .001mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference	Vert. Amp. to point Ⓑ. Low side to chassis.	A11, A12, A13, A14, A15, A16, A17	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
5.	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A18	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT - SELECTOR IN FM POSITION

Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 150Ω in each lead.	105MC (Unmod.)	(FM) 105MC	DC probe to point Ⓑ. Common to chassis.	A19, A20, A21	Adjust for maximum deflection.
7.	"	90MC	90MC	"	L5, L4, L3	" Repeat steps 6 & 7.

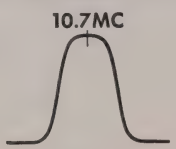


FIG. 1

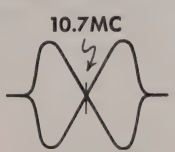


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆)
V1	FM RF Amp. - FM Mixer	12AT7
V2	FM AFC - FM Osc.	12AT7
V3	1st FM IF Amplifier	6AU6
V4	2nd FM IF Amplifier	6AU6
V5	3rd FM IF Amplifier	6AU6
V6	Ratio Detector	6AL5
V7	AM RF Amplifier	6BA6
V8	AM Converter	6BE6
V9	AM IF Amplifier	6BA6
V10	AM Detector - AVC	6AL5
V11	Tuning Indicator	6AF6G
V12	FM Cathode Follower - AM Cathode Follower	12AU7
V13	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

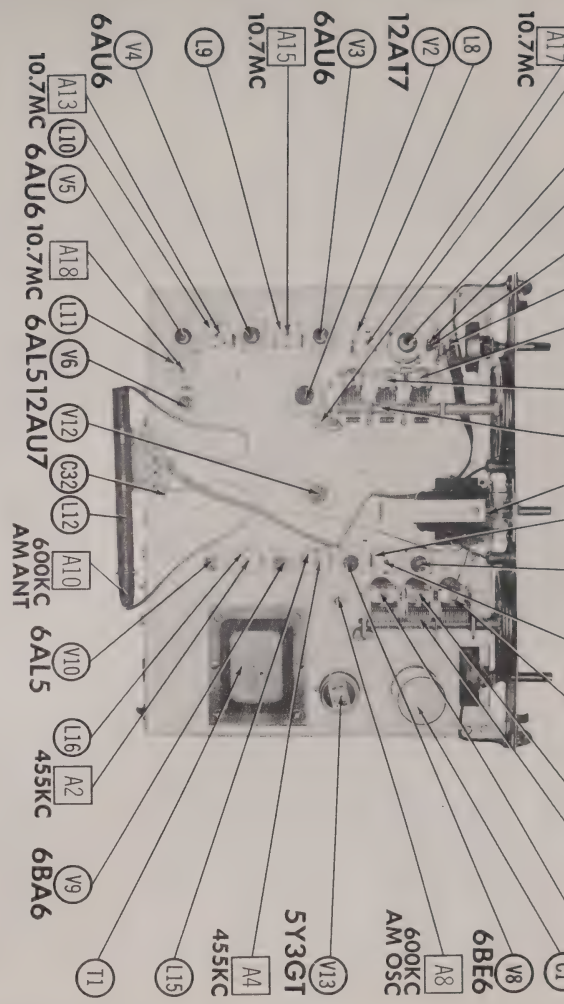
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Madison Fielding PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	450	CE-3X4023	AFH3-43-50	C0330	FP376.9	TMT-3745	TVL-3786	
B	40	350							
C	20	300							
C2	8	50	CE-8050	PRS1405	BBR8-150	TC41	TD-8-150	TVA-1405	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C4	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C5	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C6	.68 10%		NPO-SI .68	TCZ-R68				
C7	5000 10%	(10000) †	DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C8	2.2 10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C9	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102 *	B-210	5HK-D10
C11	10 P100							
C12								
C13	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103 *	B-110	5HK-S10
C15	10 P100							
C16	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C17	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C18	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C19	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C20	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C21	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C22	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C23	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C24	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C25	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C26	300 10%			D6-301	L10T3	CCD-301	GP330	10TS-T33
C27	300 10%			D6-301	L10T3	CCD-301	GP330	10TS-T33
C28	300 10%			D6-301	L10T3	CCD-301	GP330	10TS-T33
C29	1000		SI 1000	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C30	20000	Note 1	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C31	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C32	2.2 10%	Note 1	NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C33	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C34	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C35	20000		BPD-02	DD-203	BYB6S2	CCD-203 *	B-120	5HK-S20
C36	220 N470					*		
C37	220 N470					*		
C38	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C39	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C40	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C41	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C42	100 N750		N750-DI 100	DT N-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C43	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C44	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C45	20000	Note 1	BPD-02	DD-203	BYB6S3	CCD-203	B-120	5HK-S20
C46	.1 400V		P488N-1	DF-104	CUB4S1	4DP-3-104	GEM-401	4TM-P10
C47	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C48	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C49	20000	Note 1	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C50	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C51	20000	Note 1	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C52	.01 600V		P688N-01	DF-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10

Note 1. Not used in some versions. † Alternate Value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Madison Fielding PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	500K	1/4	HR3704	JP-504	48M-500K-S		MLCN55L	Level, FM
R2	500K	1/4	HR3704	JP-504	48M-500K-S		MLCN55L	Level, AM

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	68Ω				R26	1000Ω			
R4	3.3meg				R27	100Ω			
R5	10K				R28	1meg			
R6	22K				R29	1000Ω			
R7	1000Ω				R30	22K			
R8	100Ω				R31	470K			
R9	1meg				R32	18K			(15K) †
R10	470K				R33	68Ω			
R11	470K				R34	470K			
R12	100K				R35	2.2meg			
R13	1000Ω				R36	1meg			
R14	1000Ω				R37	220K			
R15	100Ω				R38	2.2meg			
R16	100K				R39	2200Ω			
R17	18K				R40	47K			
R18	100Ω				R41	2.2meg			
R19	1500Ω				R42	2200Ω			
R20	1000Ω				R43	47K			
R21	6800Ω				R44	4000Ω 5W	PW5-4000	5W-SQ-4000	Note 1
R22	6800Ω				R45	4000Ω 5W	PW5-4000	5W-SQ-4000	Note 1
R23	68K				R46	560Ω 7W	PW10-560	10W-SQ-560	
R24	68K				R47	1000Ω			
R25	2.2meg				R48	1000Ω			

† Alternate Value.
Note 1. When R45 is 1800Ω 7W, R44 is not used.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Madison Fielding PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	RF Choke (.47uh)			4588	RTC-8513	T958	
L2	RF Choke (3.3uh)		BC-564	4608	RTC-8518	T858	
L3	FM RF	LR-1002					
L4	FM Mixer Grid	LR-1002					
L5	FM Osc.	LO-1004					

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Madison Fielding PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L6	RF Choke (luh)		BC-561	4602	RTC-8515	T855	
L7	RF Choke (3.3uh)		BC-564	4608	RTC-8518	T858	
L8	1st FM IF	TI-1001	FM-254	1463	RTC-8599	T633	
L9	2nd FM IF	TI-1005	FM-254	1463	RTC-8599	T633	
L10	3rd FM IF	TI-1001	FM-254	1463	RTC-8599	T633	
L11	Ratio Detector	TI-1002	FM-255	1465	RTC-8600	T635	
L12	Loopstick	LA-1001	BC-419	705-A		T532	
L13	AM RF	TR-1001					
L14	AM Osc.	LO-1001	BC-393	69-OSC	RTC-8646	T512	
L15	1st AM IF	TI-1003	BC-352	12-C1	RTC-8632	T607	
L16	2nd AM IF	TI-1003	BC-353	12-C2	RTC-8633	T608	
L17	Fil. Choke (luh)		BC-561	4602	RTC-8515	T855	
L18	Fil. Choke (luh)		BC-561	4602	RTC-8515	T855	
L19	Fil. Choke (luh)		BC-561	4602	RTC-8515	T855	
L20	Fil. Choke (luh)		BC-561	4602	RTC-8515	T855	
L21	Fil. Choke (luh)		BC-561	4602	RTC-8515	T855	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	Madison Fielding PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .65A	580VCT .065A DC	5V @ 2A	TP-1005	P-3052	PM-8423	22R04	R-109B	
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 4A								

MISCELLANEOUS

ITEM No.	PART NAME	Madison Fielding PART No.	NOTES
M1	Tuning Cap.	CV-1005	FM, 3 Gang
M2	Tuning Cap.	CV-1001	AM, 3 Gang (Ant. 11-488mmf, RF 11-360mmf, Osc. 15-146mmf)
M3	Switch	SF-1004-3	Function Selector (Includes Power Off-On Switch) Rotary Type

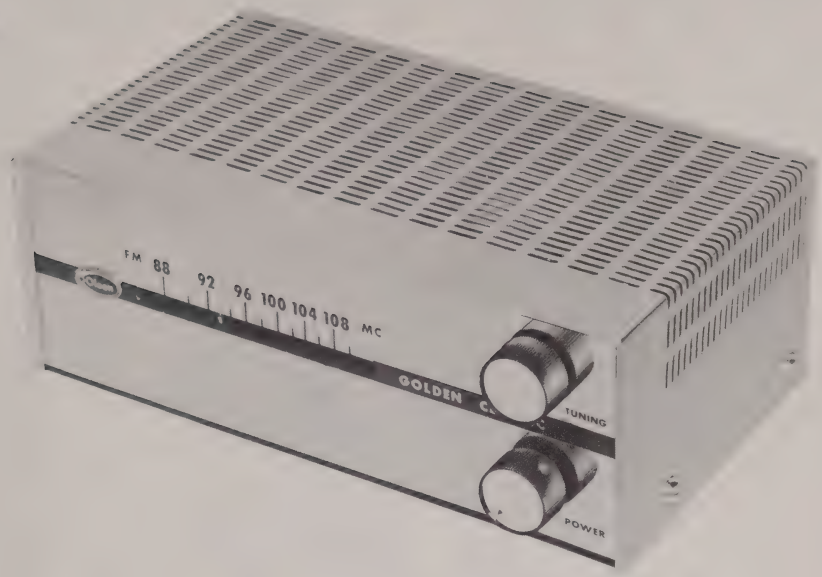
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

OLSON
MODEL RA-338

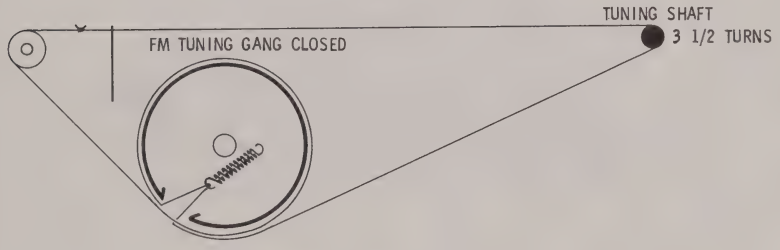
OLSON
MODEL RA-338



OLSON
MODEL RA-338

TRADE NAME	Olson Model RA-338		
SUPPLIER	Olson Radio Corp., 260 S. Forge Street, Akron 8, Ohio		
TYPE SET	AC Operated 6 Tube FM Tuner		
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles	RATING	25 Watts, .23 Amp. @117 Volts AC
TUNING RANGE — FREQ. MOD.	88 — 108MC		

DIAL CORD STRINGING



FRONT VIEW

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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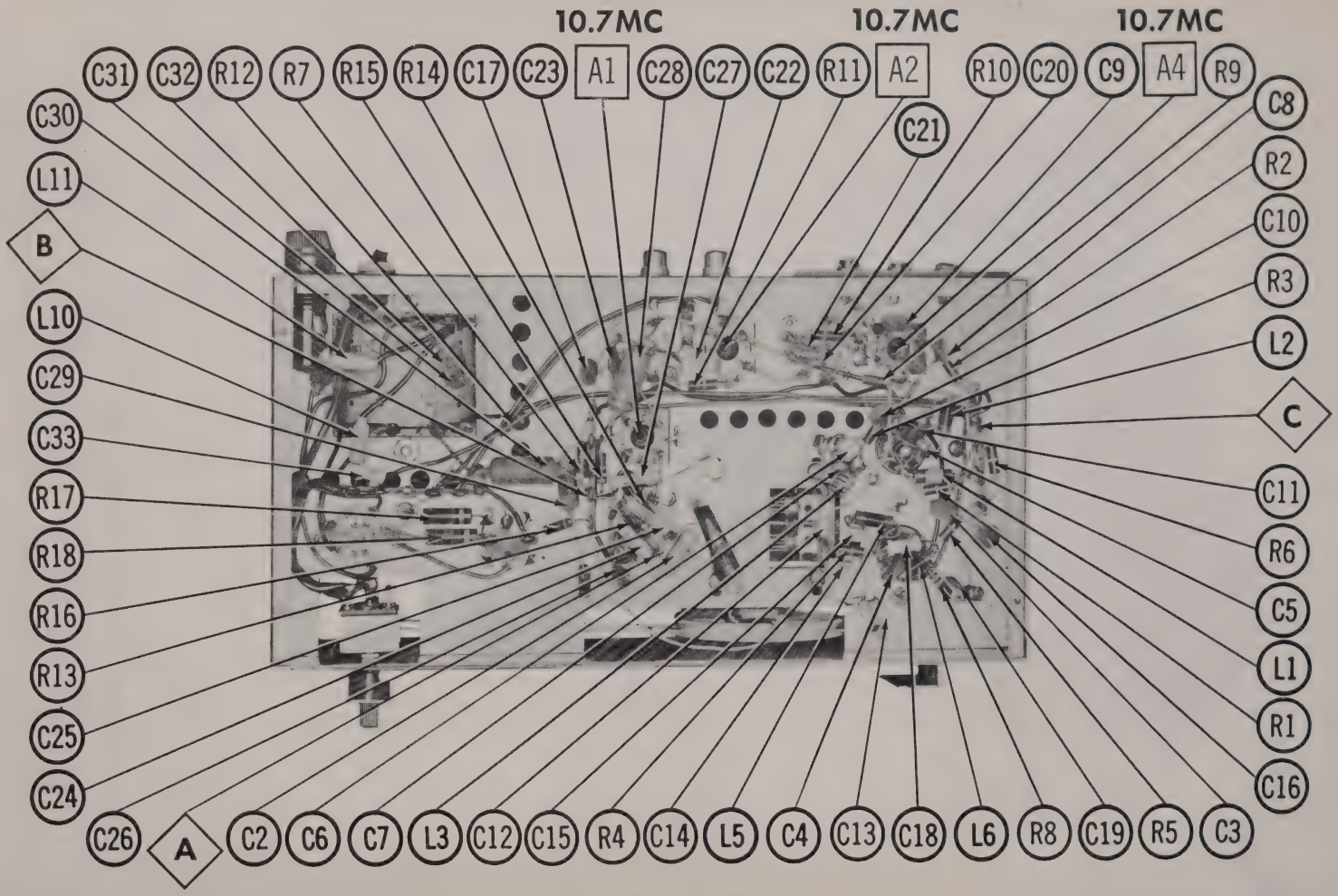
KJ540

DATE 7—61 SET 537 FOLDER 12

SET 537 FOLDER 12



CHASSIS BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools: A1 thru A6....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A7, A8.....GENERAL CEMENT #8721, 8722
WALSCO #2519

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .001mfd to pin 2 (grid) of Mixer. Low side to chassis.	10.7MC (Unmod.)	Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5	Adjust for maximum deflection.
2.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .001mfd to pin 2 (grid) of Mixer. Low side to chassis.	10.7MC (450KC Swp)	Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5	Disconnect stabilizing Capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
2.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A6	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

Short point Ⓒ to chassis.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	Across the two end terminals of antenna terminal strip.	108MC (Unmod.)	108MC	DC probe to point Ⓐ. Common to chassis.	A7, A8	Adjust for maximum deflection.
4.	"	88MC	88MC	"	L3, L4	" Repeat steps 3 and 4.

FIG. 1

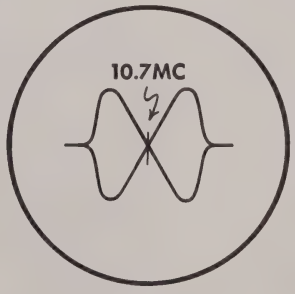


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amp. -Mixer	6AQ8	V4	Limiter	6BA6
V2	Osc. -AFC	6AQ8	V5	Ratio Detector	6AL5
V3	IF Amplifier	6BA6	V6	Rectifier	6X4

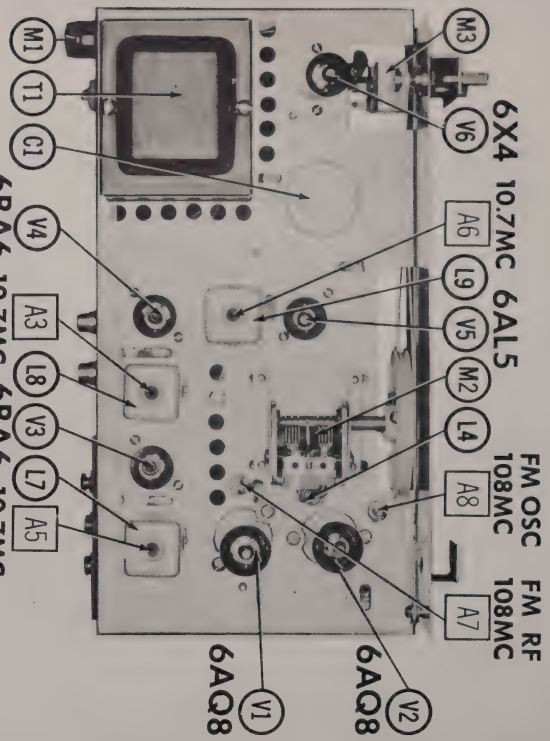
ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	OLSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150			B0160	FP214	TMD-2120	TVL-2435	
B	60	150			BR6015	TC68	TD-60-250	TVA-1415	
C	60	150							
C2	5	25		PTT-25005	NLW5-50	TT25X5	MLV5-25	TE-1202	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C4	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C5	10 N750 ±1mmf		N750-DI 10	DTN-10	C10Q10U	CCTN-100	CN7-410	10TCU-Q10
C6	10	Note 1		829-10				
C7	10 N750 ±1mmf		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C8	30 N330 5%	Note 2		TCA-33		*		10TCS-Q33
C9	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C10	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C11	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C12	1 N075 ± .5mmf					*		
C13	3-9			829-10				
C14	100 5%		NPO-SI 100	TCZ-100	C10T1C	CM-19B-101J	CNO-310	10TCC-T10
C15	5 ± .5mmf		NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C16	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-210	5HK-D20
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	5 ± .5mmf		NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-310	10TCC-V50
C19	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C20	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C21	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C22	50		SI 50	D6-500	L10Q50	CCD-500	GP450	10TS-Q50
C23	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C24	200		SI 200	D6-201	L10T2	CCD-201	GP320	10TS-T20
C25	200		SI 200	D6-201	L10T2	CCD-201	GP320	10TS-T20
C26	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20



CHASSIS—TOP VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C27	200		SI 200	D6-201	L10T2	CCD-201	GP320	10TS-T20
C28	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C29	.001 400V		P488N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C30	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C31	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C32	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C33	50		SI 50	D6-500	L10Q50	CCD-500	GP450	10TS-Q50

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Nominal Value.
Note 2. Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R1	100Ω			
R2	1000Ω			
R3	1800Ω			
R4	10K			
R5	100Ω			
R6	220K			
R7	2.2meg			
R8	470Ω			
R9	1000Ω			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R10	100Ω			
R11	220K			
R12	10K			
R13	10K			
R14	10K			
R15	68K			
R16	47K			
R17	250Ω 1W			
R18	250Ω 1W			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		OLSON PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	RF Choke (1uh)		BC-561	4602	RTC-8515	T855	
L2	RF Choke (3uh)		SW-630	4606	RTC-8517	T857	
L3	RF						
L4	Osc.						
L5	RF Choke (3uh)		SW-630	4606	RTC-8517	T857	
L6	RF Choke (3uh)		SW-630	4606	RTC-8517	T857	
L7	1st IF		FM-256	1463-PC	RTC-9046	T654	
L8	2nd IF		FM-256	1463-PC	RTC-9046	T654	
L9	Ratio Detector		FM-257	1465-PC	RTC-9053	T659	
L10	Line Choke (1uh)		BC-561	4602	RTC-8515	T855	
L11	Line Choke (1uh)		BC-561	4602	RTC-8515	T855	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
				OLSON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	PRI.	SEC. 1	SEC. 2						
	117V@ .23A	250VCT @ .035A	6.3V@ 1.8A						
	SEC. 3	SEC. 4	SEC. 5						
	6.3V@ .6A								

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			OLSON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1		1A 250V						

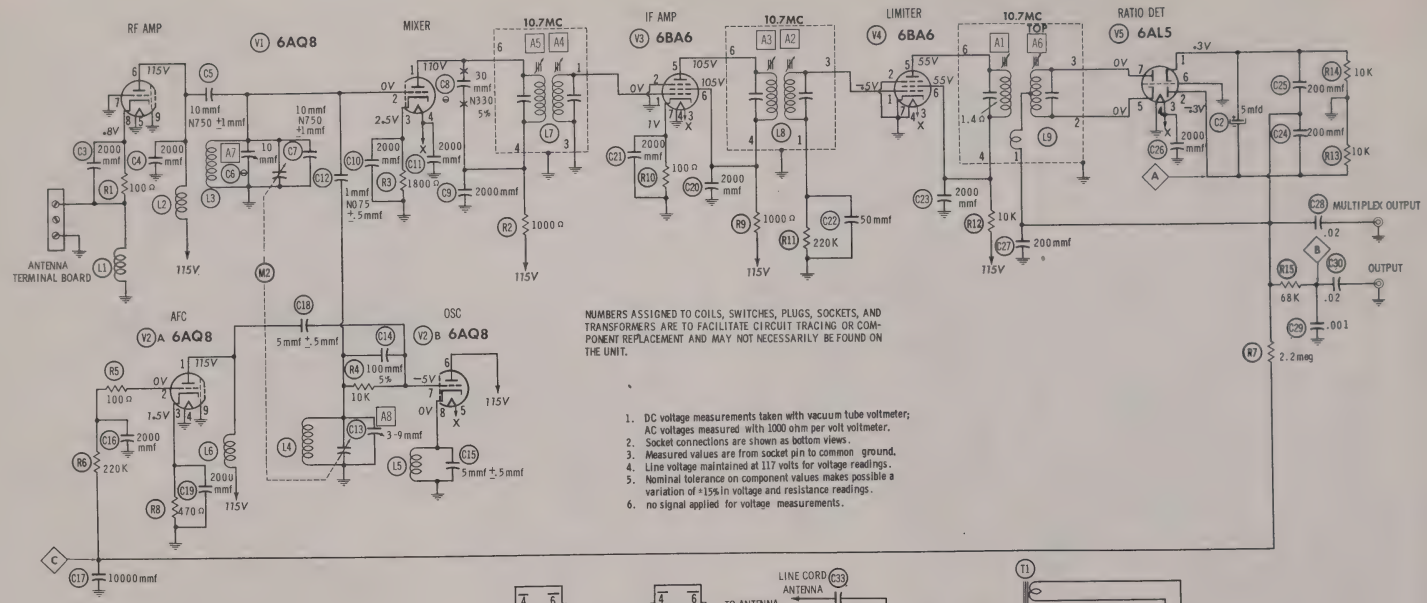
MISCELLANEOUS

ITEM No.	PART NAME	OLSON PART No.	NOTES
M2 M3	Tuning Cap. Switch		2 Gang Power Off-On

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)


RF AMP
V1 6AQ8
MIXER
10.7MC
IF AMP
V3 6BA6
10.7MC
LIMITER
V4 6BA6
10.7MC TOP
RATIO DET
V5 6AL5
ANTENNA TERMINAL BOARD
AFC
V2A 6AQ8
OSC
V2B 6AQ8
MULTIPLEX OUTPUT
OUTPUT
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. no signal applied for voltage measurements.
L7 & L8 TERMINAL GUIDE
L9 TERMINAL GUIDE
LINE CORD
ANTENNA
TO ANTENNA TERMINAL BOARD
RECT
V6 6X4
117VAC - 25 WATTS
1AMP., 250V
125VAC
135V 35ma.
115V SOURCE
NEON LAMP
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AQ8	†1500Ω	.1Ω	1800Ω	.1Ω	0Ω	†500Ω	0Ω	100Ω	0Ω
V2	6AQ8	†500Ω	INF	470Ω	.1Ω	0Ω	†500Ω	10K	0Ω	0Ω
V3	6BA6	.1Ω	0Ω	0Ω	.1Ω	†1500Ω	†1500Ω	100Ω		
V4	6BA6	220K	0Ω	0Ω	.1Ω	†10K	†10K	0Ω		
V5	6AL5	10K	10K	.1Ω	0Ω	INF	0Ω	INF		
V6	6X4	140Ω	NC	INF	INF	NC	145Ω	¶		

† MEASURED FROM PIN 7 OF V6. NC NO CONNECTION
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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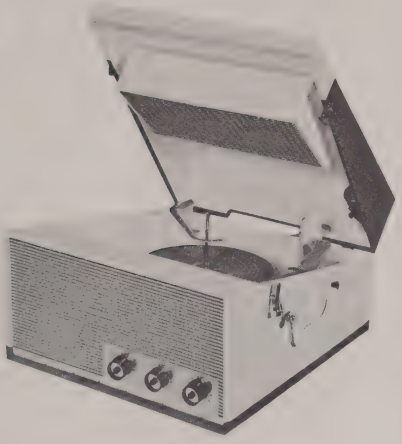
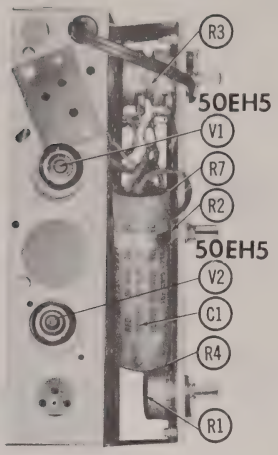
OLSON
MODEL RA-338

PHOTOFACT® Folder

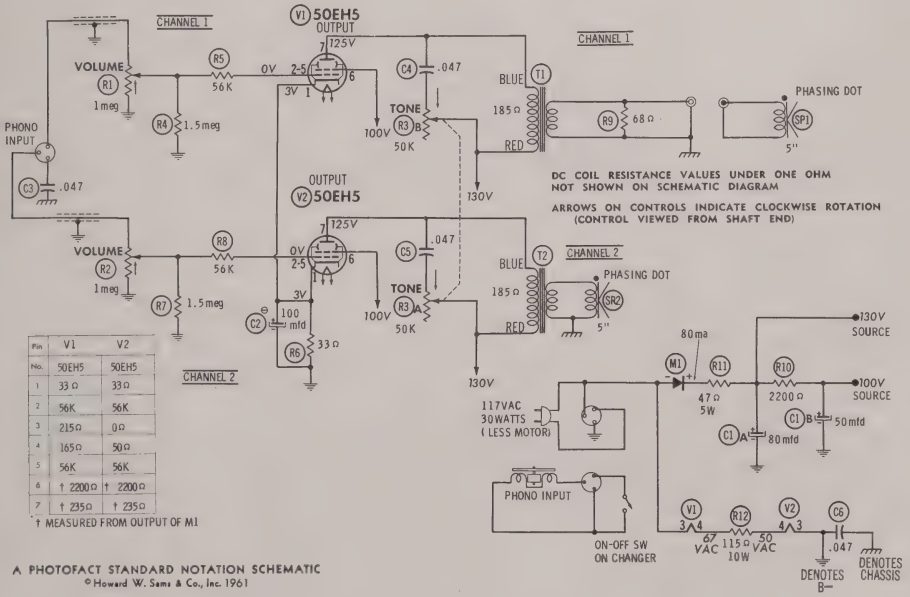
SYLVANIA MODEL 45P10 Series (Ch. 656-1)





TRADE NAME	Sylvania Model 45P10 Series (Ch. 656-1)
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products, Inc., 700 Ellicott St., Batavia, N. Y.
TYPE SET	AC Operated 2 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 30 Watts, .3 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER – SEE SIMILAR MONARCH UA8 – PHOTOFACT SET 381 FOLDER 11
OR RECORD CHANGER MANUAL RC-11



Pin No.	V1 50EH5	V2 50EH5
1	33Ω	33Ω
2	56K	56K
3	215Ω	0Ω
4	165Ω	50Ω
5	56K	56K
6	↑ 2200Ω	↑ 2200Ω
7	↑ 235Ω	↑ 235Ω

↑ MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KT541

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SYLVANIA MODEL 45P10 Series (Ch. 656-1)
SET 537 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 Output	50EH5	V2	Channel 2 Output	50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	161-2019	PRS2240	BBRD8515	TCD498	TDLD-12	TVA-2462	
B	50	150							
C2	100	15		PRS1200	BBR100-15	TC2501	TD-100-15	TVA-1160	①

① Some versions may use 100mfd@10V in this application (Part #161-1070).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	153-0224	B-70	A47-1meg-Z	Q13-137	U53	Volume, Channel 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1meg	½	153-0224	B-70	A47-1meg-Z	Q13-137	U53	Volume, Channel 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	50K	½	153-0225	B-31	AD47-50K-S		FA54L	Tone, Channel 2
B	50K	½		SR-31	Not Req.		RU54L	Tone, Channel 1
C	Shaft			Not Req.	KSS-3		CS3500	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	1.5meg			
R5	56K			
R6	33Ω			
R7	1.5meg			
R8	56K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R9	68Ω			
R10	2200Ω			
R11	47Ω 5W	PW5-47	5W-SQ-47	
R12	115Ω 10W	PW10-115	10W-SQ-115	

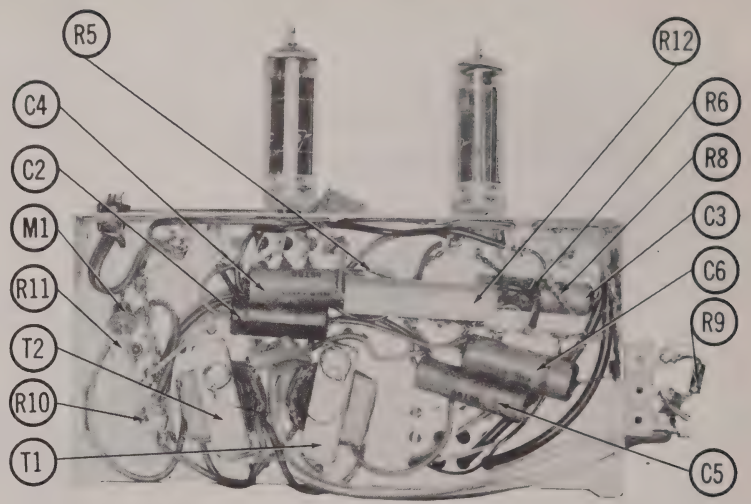
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SYLVANIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4500Ω	3-4Ω	143-0091	A-3026	A-3877①	24S48	S-6X	① Drill New Mounting Hole(s).
T2	4500Ω	3-4Ω	143-0091	A-3026	A-3877①	24S48	S-6X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SYLVANIA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5"	PM	3-4Ω	539-0512	5A07R	
SP2	5"	PM	3-4Ω	539-0512	5A07R	

CHASSIS—BOTTOM VIEW



POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA SYLVANIA PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.080A	517-0024	1N1763	20H	SR200	

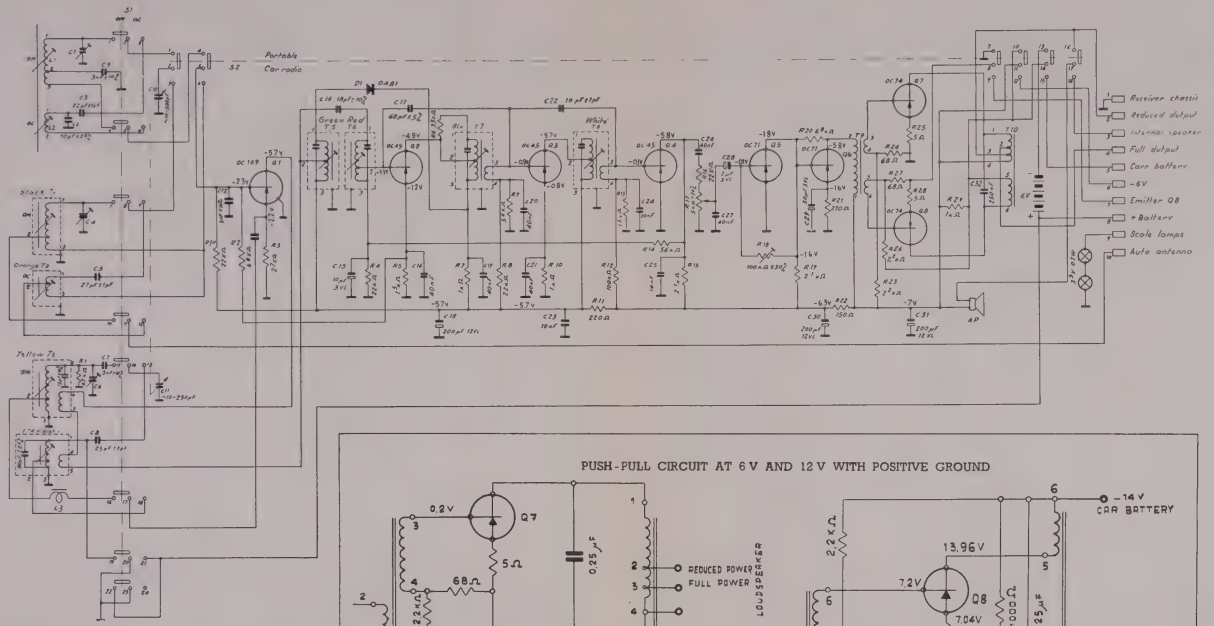
PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA SYLVANIA PART No. CARTRIDGE	SYLVANIA PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M2	916-0024	902-0012 * (LP)	70-TS	Not Req.	96T	Not Req.	12TH-S	Not Req.	
		902-0013 * (78 RPM)							
	916-0019	902-0014* (LP)	76-TS-TB	N8-7 * & N8-3 *	26S	S1-1 * & S3-3 *	8TA4-S	N-8TA-S	Alternate
		902-0015 * (78 RPM)							

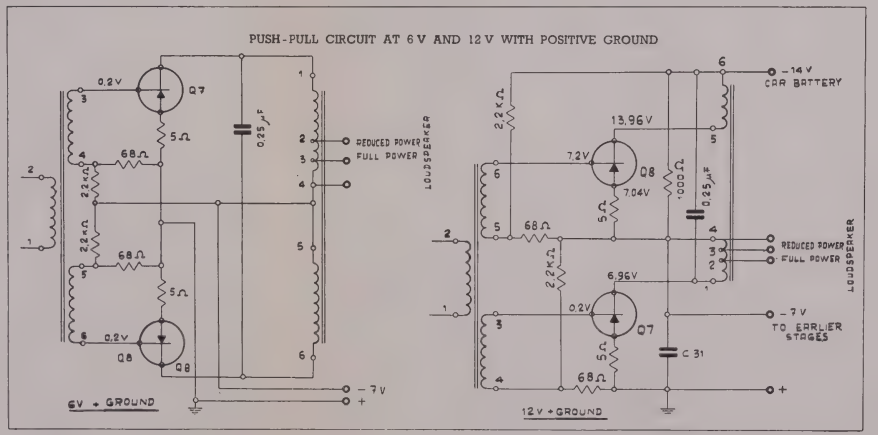
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



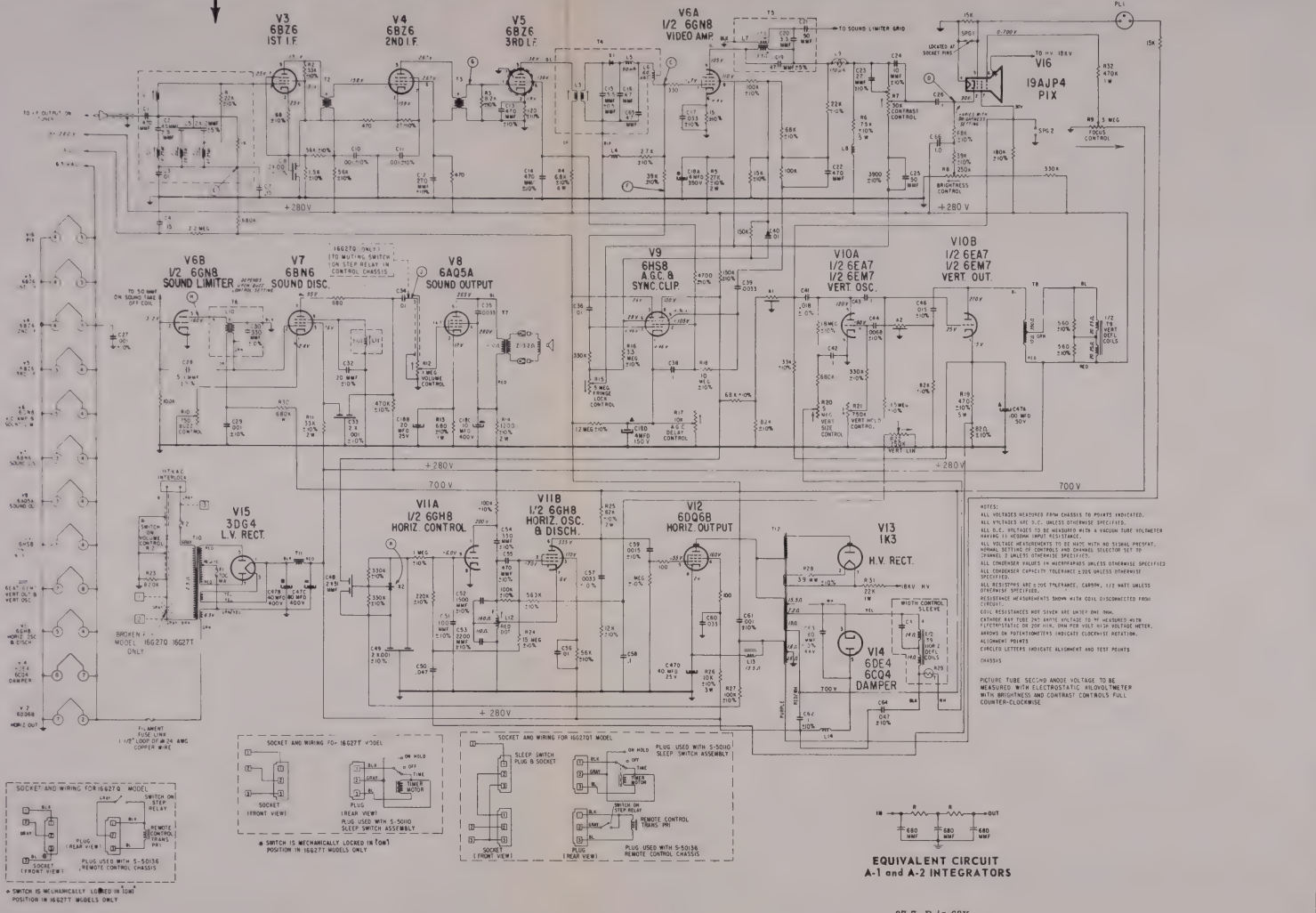
NOTE: The voltages indicated in the diagram are average.
Measurements are taken with a 20.000 ohm/V instrument on a receiver connected to a 7 V or 14 V supply with no input signal.

Fixed resistors: tolerance ±10 %, max. rating 1/2 W at 40° C.
Fixed condensers: tolerance ±10 % except where stated otherwise
Electrolytic condensers: tolerance — 10 + 100 %.



AUTOVOX MODEL TRANSMOBILE 2 (TR 222)

Schematic Diagram Courtesy of Autovox Corporation of America


V3 6BZ6 1ST I.F.
V4 6BZ6 2ND I.F.
V5 6BZ6 3RD I.F.
V6A 1/2 6GN8 VIDEO AMP.
V16 19AJP4 PIX
V6B 1/2 6GN8 SOUND LIMITER
V7 6BN6 SOUND DISC.
V8 6AQ5A SOUND OUTPUT
V9 6HS8 A.G.C. & SYNC. CLIP.
V10A 1/2 6EA7 1/2 6EM7 VERT. OSC.
V10B 1/2 6EA7 1/2 6EM7 VERT. OUT.
V15 3DG4 L.V. RECT.
V11A 1/2 6GH8 HORIZ. CONTROL
V11B 1/2 6GH8 HORIZ. OSC. & DISCH.
V12 6DQ6B HORIZ. OUTPUT
V13 1K3 H.V. RECT.
V14 6DE4 6CQ4 DAMPER
+280 V
700 V
EQUIVALENT CIRCUIT A-1 and A-2 INTEGRATORS

ZENITH MODELS F2112W, WU, G2105C, CU, L, LU, G2110B, BU, G, GU, G2112J, JU, W, WU, G2213G, G2214L, G2215J, L, G2216L (CH. 16G27, Q, QT, T, U)

87-7 R is 68K
87-8 R is 82K

Schematic Diagram Courtesy of Zenith Radio Corporation

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EIA PRODUCTION SOURCE CODE - 1961

Code symbols assigned to radio-television manufacturers and suppliers, arranged both alphabetically by companies and numerically by code numbers.

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1721 De Sales Street, N. W. Washington, 6 D. C.

HOWARD W. SAMS & CO., INC.
Indianapolis 6, Indiana

ALPHABETICAL LIST

EIA Code Symbols
January 1, 1961
(* Indicates non-members)

Company	Code No.
*ACDC Electronics, Inc., Burbank, Calif.	1030
*Acme Coil & Transformer Corp., Chicago 14, Ill.	928
*Acme Electric Corporation, Cuba, N. Y.	413
*Adams Electronics Inc., Bangor, Mich.	1092
Adler Electronics, Inc., New Rochelle, N. Y.	813
*Admiral Corporation, Chicago 47, Ill.	101
Advance Ross Electronics Corp., Chicago 45, Ill.	286
*Aerolite Electronics Corp., Union City, N. J.	910
Aerovox Corporation, New Bedford, Mass.	102
*Ajax Condenser Co., Inc., Chicago 14, Ill.	705
Aladdin Electronics, a Division of Aladdin Industries, Inc., Nashville 10, Tenn.	689
*A.L.A. Industries, Inc., Harrison, N. Y.	1031
*Albergo Transformer Co., Chicago 22, Ill.	883
Alcon Metal Products, Inc., Chicago 47, Ill.	573
Allen-Bradley Company, Milwaukee 4, Wis.	106
The Alliance Manufacturing Co., Inc., Alliance, Ohio	107
All Star Products, Inc., Defiance, Ohio	110
Alpha Metals, Inc., Jersey City 4, N. J.	733
Altec Lansing Corporation, Anaheim, Calif.	391
American Electronics Company, Mineola, L. I., N. Y.	978
*American Lava Corporation, Chattanooga 5, Tenn.	681
*American Magnetics Corporation, Carterville, Illinois	1089
*American Radionic Co., Inc., Danbury, Conn.	648
American Television & Radio Co., St. Paul 1, Minn.	551
*American Transformer Corp., Chicago 7, Ill.	892
Amperex Electronic Corporation, Hicksville, L. I., N. Y.	111
Ampex Magnetic Tape Products, Div. Ampex Corp., Opelika, Ala.	840
Amphenol-Borg Electronics Corp., Broadview, Ill.	554
*The Amplifone Corporation, Chicago 40, Ill.	1002
*Anaconda Wire & Cable Company, Hastings-on-Hudson 6, N. Y.	547
*Andrea Radio Corporation, Long Island City 1, N. Y.	113
Andrew Corporation, Chicago 19, Ill.	402
Andrews Tower, Inc., Fort Worth 19, Tex.	852
The Antenna Specialists Company, Cleveland 6, Ohio	920
Anton Electronic Laboratories, Inc., Brooklyn 37, N. Y.	961
*Apex Coil & Transformer Corp., Chicago 8, Ill.	949
*Arco Electronics, Inc., New York 13, N. Y.	1128
A. R. F. Products, Inc., River Forest, Ill.	115
Armel Electronics Inc., North Bergen, N. J.	893
The Arnold Engineering Company, Sub. of Allegheny Ludlum Steel Corp., Marengo, Ill.	116
Arvin Industries, Inc., Columbus, Ind.	248
*Associated Transformer Corp., Chicago 47, Ill.	1035
*Astro-Tran, West Acton, Mass.	1104
Atlantic Wire & Cable Corp., College Point 56, N. Y.	792
Audio Devices, Inc., New York, N. Y.	1051
*Automatic Radio Mfg. Co., Inc., Boston 15, Mass.	120
Barker & Williamson, Inc., Bristol, Penna.	461
*Bartlett Manufacturing Company, Glenview, Ill.	985
Basler Electric Company, Highland, Ill.	695
The Bead Chain Manufacturing Co., Bridgeport 5, Conn.	122
Belden Manufacturing Company, Chicago 44, Ill.	579
Bendix Radio, Division of Bendix Corp., Baltimore 4, Md.	125
*Best Manufacturing Co., Inc., Irvington 11, N. J.	371
*Better Coil & Transformer Corp., Goodland, Ind.	831
*Blackburn Electronic Corporation, Wyoming, Pa.	912
Bliley Electric Company, Erie, Pa.	128
Bogen-Presto Division, The Siegler Corp., Paramus, N. J.	589
Bomac Laboratories Inc., Sub. Varian Associates, Beverly, Mass.	940
*Bradford Components, Inc., Salamanca, N. Y.	1044
*Bradley Semiconductor Corporation, New Haven 11, Conn.	812
*Bristol Motors Div., Vocaline Co. of America, Inc., Old Saybrook, Conn.	1088
British Industries Corporation, Port Washington, L. I., N. Y.	409
*Caddell-Burns Mfg. Co. Inc., Mineola, N. Y.	1071
Caledonia Electronics & Transformer Corp., Caledonia, N. Y.	503
*California Magnetic Control Corp., North Hollywood, Calif.	799
Callins Industries, Inc., Greenfield, Tenn.	1068
*Calvideo Tube Corporation, Compton, California	886
Campbell Industries, Inc., Sub., Clarostat Mfg. Co., Dover, N. H.	1017
*Cannon Electric Company, Los Angeles 31, Calif.	440
C. F. Cannon Co., Springwater, N. Y.	133
*CapTran Corporation, Chicago 22, Ill.	1038
*Carbonneau Industries, Grand Rapids 2, Mich.	719
*Carol Electronics Corporation, Martinsburg, W. Va.	837
Carter Parts Company, Skokie, Ill.	610
C-B-C Electronics Co., Inc., Philadelphia 20, Pa.	867
CBS Electronics, Division of Columbia Broadcasting System Inc., Danvers, Mass.	210
Celco (Constantine Engineering Labs. Co.), Mahwah, N. J.	692
Centralab, Div. of Globe-Union Inc., Milwaukee 1, Wis.	134
*Central Coil Company, Indianapolis 22, Ind.	637
Central Electronic Manufacturers, Denville, N. J.	841
*Channel Master Corporation, Ellenville, N. Y.	1059
Chemtronic Corporation, Nashville 4, Tenn.	1064
*Chester Cable Corp., Chester, N. Y.	909
Chicago Condenser Corporation, Chicago 47, Ill.	135
*Chicago Electronic Engineering Co., Chicago 47, Ill.	166
*Chicago Standard Transformer Division, Essex Wire Corp., Chicago 18, Ill.	138
*Cinaudagraph Inc., Chicago 26, Ill.	145
Cinch Manufacturing Company, Chicago 24, Ill.	139
Clarostat Mfg. Co., Inc., Dover, N. H.	140
*Cleveland Electronics, Inc., Cleveland 3, Ohio	433
Clevite Transistor, Div. of Clevite Corp., Waltham 54, Mass.	856
*Clippard Instrument Laboratory, Inc., Cincinnati 39, Ohio	530
*Coilcraft, Incorporated, Cary, Ill.	906
*Coil Engineering & Mfg. Co., Inc., Roanoke, Ind.	141
Collins Radio Company, Cedar Rapids, Ia.	439
Columbia Technical Corporation, Woodside 77, N. Y.	1048
Columbus Electronics Corp., Semiconductor Div., Yonkers, N. Y.	1103
*Columbus Process Co., Inc., Columbus, Ind.	450
Communication Accessories Company, Sub., Collins Radio Co., Lee's Summit, Mo.	1019
*Communication Measurements Laboratory, Inc., Plainfield, N. J.	427

Company	Code No.
Connector Corporation, Chicago 30, Ill.	888
Conrac Incorporated, Glendora, Calif.	680
Consolidated Wire & Associated Companies, Chicago 16, Ill.	607
Continental-Wirt Electronics Corp., Philadelphia 44, Pa.	146
Continental Electronics Corp. of Calif., Los Angeles 58, Calif.	811
Convair/Pomona, Div. of General Dynamics Corp., Pomona, Calif.	898
Cornell-Dubilier Corporation, Fuquay Springs, N. C.	1077
Corning Glass Works, Corning, N. Y.	148
Cosmic Radio Corporation, New York 59, N. Y.	704
*Crest Transformer Corp., Hoopeston, Ill.	839
Croname, Incorporated, Chicago 48, Ill.	151
Crosley Division, Avco Corp., Cincinnati 25, Ohio	152
CTS Corporation, Elkhart, Ind.	137
Cubic Corporation, San Diego 11, Calif.	870
Dale Electronics, Inc., Columbus, Nebr.	816
J. W. Davis & Company, Dallas 35, Texas	563
*Davis Electric Company, Cape Girardeau, Mo.	628
Daystrom, Incorporated, Newark 12, N. J.	338
*Dearborn Glass Company, Bedford Park, Ill.	385
*DeJur-Amsco Corporation, Long Island City 1, New York	780
Delco Radio Division, General Motors Corporation, Kokomo, Ind.	466
Delevan Electronics Corp., East Aurora, N. Y.	986
*DeWald, Div. of United Scientific Labs. Inc., Long Island City 1, N. Y.	155
*Dinion Coil Co., Inc., Caledonia, N. Y.	895
R. L. Drake Company, Miamisburg, Ohio	851
Drake Manufacturing Company, Chicago 31, Ill.	586
*Dresser Electronics, HST Div., Garland, Tex.	1072
*Wilbur B. Driver Company, Newark 4, N. J.	156
DuKane Corporation, St. Charles, Ill.	252
Allen B. DuMont Laboratories, Clifton, N. J.	158
*DX Radio Products Company, Inc., Chicago 47, Ill.	159
*Hugh H. Eby Company, Philadelphia 44, Penna.	160
*Efcon, Incorporated, Garden City, L. I., N. Y.	1106
Eitel-McCullough, Inc., San Carlos, Calif.	162
*Elco Corporation, Philadelphia 24, Penna.	599
*Electrical Utilities Company, La Salle, Ill.	569
*Electrical Windings, Inc., Chicago 39, Ill.	682
*Electro Engineering Works, San Leandro, Calif.	1033
The Electro Motive Mfg. Co., Inc., Willimantic, Conn.	164
*Electronic Components Corporation, Addison, Ill.	515
*Electronic Devices, Inc., New Rochelle, N. Y.	752
*Electronic Engineering Company of California, Santa Ana, Calif.	941
*Electronic Enterprises, Inc., Newark 4, N. J.	545
*Electronic Specialty Co., Los Angeles 39, Calif.	169
Electronic Tube Corporation, Philadelphia 18, Penna.	170
Electrons, Incorporated, Newark 3, N. J.	935
Electro-Products, Inc., Detroit 27, Mich.	903
*Electro-Voice, Inc., Buchanan, Mich.	649
*Electro-Winders Co., Inc., Covina, Calif.	984
*El-Rad Manufacturing Co., Chicago 18, Ill.	632
EMCOR-Ingersoll Products Div., Borg-Warner Corp., Elgin, Ill.	902
*Emerson Radio & Phonograph Corp., Jersey City 2, N. J.	171
*Engineered Electronics Company, Santa Ana, Calif.	1134
Ensign Coil Company, Chicago 23, Ill.	172
Entron Inc., Bladensburg, Md.	1058
Erca Tool Die & Stamping Co., Brooklyn 22, N. Y.	762
Erie Resistor Corporation, Erie, Pa.	173
*ESC Electronics Corporation, Palisades Park, N. J.	1069
Espey Mfg. & Electronics Corp., Saratoga Springs, N. Y.	174
*Esquire Radio Corporation, Brooklyn 19, N. Y.	742
*Essex Electronics, Berkeley Heights, N. J.	425
*Essex Wire Corporation, Fort Wayne 6, Ind.	175
*Fanon Electronic Industries, Inc., Newark 12, N. J.	1117
John E. Fast & Company, Chicago 18, Ill.	178
*Fastex Division, Illinois Tool Works, Des Plaines, Ill.	1
Ferranti Electric, Inc., Plainview, L. I., N. Y.	1040
*Filtors, Inc., Port Washington, L. I., N. Y.	977
*A. J. Fischer, Inc., DeLand, Fla.	1129
*Fischer Electric Co., Inc., De Leon Springs, Fla.	1006
*Florida-Merit Inc., Hollywood, Fla.	987
Forbes & Wagner, Inc., Silver Creek, N. Y.	701
Foto-Video Laboratories, Inc., Cedar Grove, N. J.	963
*The Forest Electric Company, Forest Park, Ill.	773
*Foster Transformer Company, Cincinnati 23, Ohio	394
*L. H. Frost & Co., Inc., Grand Rapids 8, Mich.	746
*Fugle-Miller Laboratories, Clark, N. J.	1003
*F. & V. Coil Winding Corporation, Newark 5, N. J.	572
Gavitt Wire & Cable Co., Division Amerace Corp., Brookfield, Mass.	360
*Gefco Manufacturing Company, Grayslake, Ill.	1056
*General Cable Corporation, New York 17, N. Y.	571
General Electric Company, Syracuse 1, N. Y.	188
General Electrodynamics Corp., Garland, Tex.	1120
*General Electronics, Inc., Paterson 3, N. J.	189
The General Industries Company, Elyria, Ohio	190
General Instrument Corporation, Newark 4, N. J.	191
Automatic Manufacturing Division, Newark 4, N. J.	119
• Semiconductor Division, Newark 4, N. J.	990
General Magnetic Corporation, Detroit 34, Mich.	193
General Mills, Inc., Mechanical Division, Minneapolis 13, Minn.	927
*General Precision Inc., GPL Div., Pleasantville, N. Y.	582
General Products Corporation, Union Springs, N. Y.	913
General Radio Company, West Concord, Mass.	194
General Railway Signal Company, Rochester 2, N. Y.	644
Glaser-Steers Corporation, Newark 4, N. J.	670
The Fred Goat Co., Inc., Brooklyn 17, N. Y.	197
Good-All Electric Mfg. Co., Ogalalla, Nebr.	446
*Gordos Corporation, Bloomfield, N. J.	806
*Gramer-Halldorson Transformer Corp., Chicago 39, Ill.	596
*Grand Coil Winders, Grand Haven, Mich.	986
*Grand Tran, Inc., Benton Harbor, Mich.	1097
*Grand Transformers, Inc., Grand Haven, Mich.	757
Grayhill, La Grange, Ill.	992
*Gray & Kuhn Inc., Westbury, L. I., N. Y.	1028
Gremar Manufacturing Co., Inc., Wakefield, Mass.	1045
The Grigsby Company, Inc., Arlington Heights, Ill.	467
The Gudeman Company, Chicago 10, Ill.	438
*Guthman Division, Essex Wire Corp., Chicago 7, Ill.	198
*The Hallicrafters Co., Chicago 24, Ill.	199
*Hamilton-Hall Resistor Corp., Milwaukee 2, Wis.	936
*Hamilton Labs., Inc., Bristol, Pa.	1131
Hammarlund Mfg. Co., Sub. of Telechrome Mfg. Corp., Amityville, N. Y.	201
*Hammond Organ Company, Chicago, Ill.	1122
Hardwick, Hindle, Inc., Newark 5, N. J.	411
Harman-Kardon, Inc., Plainview, L. I., N. Y.	794
*Hathaway Instruments, Inc., Denver 22, Colo.	1110
Hawley Products Company, St. Charles, Ill.	204
Hazeltine Corporation, Little Neck 62, N. Y.	376
*Henald Manufacturing Co. Inc., Piper City, Ill.	808
*Heppner Manufacturing Company, Round Lake, Ill.	575
The Hickok Electrical Instrument Co., Cleveland 8, O.	508
*Hillburn Electronics Corp., Brooklyn 22, N. Y.	687
*Hindle Transformer Company, Inc., Flemington, N. J.	1133
*Hinners-Galanek Radio Corp., Cavalier Radio & Television Div., Forest Hills 74, N. Y.	786
Hi-Q Division Aerovox Corporation, Olean, N. Y.	163
Hoffman Electronics Corporation, Los Angeles 7, Calif.	207
*Holyoke Wire and Cable Corporation, Holyoke, Mass.	372
*Hopkins Engineering Company, San Fernando, Calif.	791
*Horton and Hubbard Manufacturing Co., Nashua, N. H.	1076
Huggins Laboratories, Inc., Sunnyvale, Calif.	964
Hughes Aircraft Company, Culver City, Calif.	744
Hycon Mfg. Company, Pasadena, Calif.	1007
Hy-Gain Antenna Products Company, Lincoln, Nebr.	894
Illinois Condenser Company, Chicago 22, Ill.	616
*Indiana Products, Inc., Sub. of Standard Electrical Products Co., Richmond, Ind.	1113
*The Indiana Steel Products Company, Valparaiso, Ind.	211
*Inductor Engineering, Inc., Lewes, Del.	915
Industrial Development Engineering Associates, Inc. Indianapolis 26, Ind.	638
*Industrial Electronic Corporation, New York 12, N. Y.	866
*Industrial Television, Inc., Clifton, N. J.	541
Industro Transistor Corporation, Long Island City 6, N. Y.	1053
International Electronic Industries, Inc., Nashville 4, Tenn.	911
International Electronics Corp., New York 12, N. Y.	1022
International Electronic Research Corp., Burbank, Calif.	1023
International Rectifier Corporation, El Segundo, Calif.	845
International Resistance Company, Philadelphia 8, Pa.	214
International Telephone and Telegraph Corporation	
ITT Federal Laboratories, Ft. Wayne, Ind.	938
ITT Federal Laboratories, Clifton, N. J.	179
Intelex Systems, Inc., New York 4, N. Y.	1109
*Ion Capacitor Corp., Columbia City, Ind.	1013
*Iron Fireman Manufacturing Co., Portland, Ore.	1123
Jackson Electrical Instrument Co., Dayton 2, Ohio	216
*James Electronics, Inc., Chicago 18, Ill.	863
*JB Electronic Transformers, Inc., Chicago 47, Ill.	2
J-B-T Instruments, Inc., New Haven 8, Conn.	442
*J & D Transformers, Inc., North Chili, N. Y.	1127
Jeffers Electronics Division, Speer Carbon Company, Dubois, Penna.	724
*Jefferson Electric Company, Bellwood, Ill.	218
Jensen Manufacturing Company, Div. of The Muter Company, Chicago 38, Ill.	220
Jerrold Electronics Corporation, Philadelphia 32, Pa.	923
Jersey Specialty Co., Inc., Mountainview, N. J.	730
*Jet Electronics Corporation, Azusa, Calif.	1004
JFD Electronics, Inc., Brooklyn 4, N. Y.	221
E. F. Johnson Company, Inc., Waseca, Minn.	222

Company	Code No.
*Johnson Electric Coil Co., Franklin Park, Ill.	1096
Johnson Electronics Inc., Casselberry, Fla.	784
Kay Electric Company, Pine Brook, N. J.	620
*Kemtron Electron Products, Inc., Newburyport, Mass.	1016
Kentron Hawaii Ltd., Honolulu 14, Hawaii	1054
Kester Solder Company, Chicago 39, Ill.	224
*Keystone Electronics Company, Newark 4, N. J.	699
Kimble Glass Company, Sub. of Owens-Illinois Glass Co., Toledo 1, Ohio	647
King Laboratories, Inc., Syracuse 3, N. Y.	225
Kip Electronics Corporation, Stamford, Conn.	593
*Kline Iron and Steel Company, Columbia, S. C.	869
*The James Knights Company, Sandwich, Ill.	504
*Kobzy Tool Company, Chicago 22, Ill.	594
Leach Corporation, Compton, Calif.	1024
Lear, Inc., Santa Monica, Calif.	227
*Lectrohm, Inc., Chicago 30, Ill.	974
Lenz Electric Manufacturing Co., Chicago 47, Ill.	228
*Leonard Electric Products Co., Inc., Brooklyn 32, N. Y.	570
*LIECO, Incorporated, Syosset, L. I., N. Y.	1126
Littelfuse, Incorporated, Des Plaines, Ill.	230
Litton Industries, Beverly Hills, Calif.	879
Lowell Manufacturing Company, St. Louis 17, Mo.	657
*Lumen, Inc., Joliet, Ill.	1078
Machlett Laboratories, Inc., Sub. of Raytheon Co., Springdale, Conn.	231
The Magnavox Company, Fort Wayne 4, Ind.	232
*Magnetic Coil Manufacturing Company, Chicago 22, Ill.	933
*Magnetic Windings Division (Essex Wire Corporation), Easton, Pa.	352
P. R. Mallory & Co., Inc., Indianapolis 6, Ind.	235
*Marvel Electric Corporation, Chicago 22, Ill.	989
*Mayfair Molded Products Corporation, Schiller Park, Ill.	1041
McCoy Electronics Co., Mt. Holly Springs, Penna.	832
McGregor Electronic Industries, Inc., McGregor, Ia.	789
*McIntosh Laboratory, Inc., Binghamton, N. Y.	793
Measurements Div., McGraw-Edison Co., Boonton, N. J.	236
M.E.C., Inc., Nashville, Tenn.	885
*Mel-Rain Corporation, Indianapolis 3, Ind.	834
*Melrose Products, Inc., Willow Grove, Pa.	1083
Merit Coil & Transformer Corp., Hollywood, Fla.	239
Metals & Controls Div., Texas Instruments Inc., Attleboro, Mass.	1075
*Methode Manufacturing Corp., Chicago 31, Ill.	720
Micamold Electronics Manufacturing Corp., Sub. General Instrument Corp., Newark 4, N. J.	240
*Microtran Company, Inc., Valley Stream, L. I., N. Y.	768
Midland Manufacturing Co., Inc., Kansas City 15, Kan.	828
*Mid-West Coil & Transformer Co., Chicago 14, Ill.	549
*Midwest Speaker Company, McGregor, Iowa	993
James Millen Manufacturing Co., Inc., Malden 48, Mass.	242
Milwaukee Resistor Company, Milwaukee 4, Wis.	722
Minneapolis-Honeywell Regulator Co., Semiconductor Products Div., Minneapolis 8, Minn.	1087
*Model Engineering & Manufacturing Inc., Chicago 18, Ill.	976
Moloney Electric Company, St. Louis 20, Mo.	965
Mosley Electronics, Incorporated, Bridgeton, Mo.	750
Motorola Inc., Chicago 51, Ill.	185
Multi-Tron Laboratory, Inc., Westchester, Ill.	693
The Muter Company, Chicago 5, Ill.	244
Mycalex Corporation of America, Clifton, N. J.	642
*National Aeronautical Corporation, Fort Washington, Pa.	643
*National Company, Inc., Malden 48, Mass.	245
*National Electronics, Inc., Geneva, Ill.	749
National Semiconductor Corporation, Danbury, Conn.	1105
*National Tel-Tronics Corp., Yonkers, N. Y.	999
*National Video Corporation, Chicago 32, Ill.	836
*Newcomb Electronics Corporation, Hollywood 38, Calif.	437
North American Aviation, Inc., Los Angeles 45, Calif.	967
North American Philips Company, Inc., New York 17, N. Y.	423
Northwest Plastics, Inc., St. Paul 7, Minn.	723
Nortronics, A Div. of Northrop Corporation, Hawthorne, Calif.	1079
*NYT Manufacturing Co., Inc., Alpha, N. J.	366
Oak Mfg. Co., Crystal Lake, Ill.	249
*Oaktron Electric Company, Tinley Park, Ill.	934
*Oaktron Industries Inc., Monroe, Wis.	918
*Ogden Coil & Transformer Co., Chicago 23, Ill.	776
The Ohio Carbon Company, Cleveland 11, Ohio	250
Ohmite Manufacturing Company, Skokie, Ill.	251
*Olympic Products Co., Inc., Alpha 1, N. J.	740
Olympic Radio & Television, Div. The Siegler Corp., Long Island City 1, N. Y.	200
Onondaga Electronics Div., Speer Carbon Co., Syracuse 1, N. Y.	848
*Ontario Industries, Inc., Hornell, N. Y.	960
*Otis Radio & Electric Corp., Hawarden, Iowa	552
*Ovenaire, Inc., Charlottesville, Va.	1100
Oxford Electric Corporation, Chicago 15, Ill.	465
*Pacific Mercury Electronics, Sepulveda, Calif.	1086
Pacific Semiconductors, Inc., Lawndale, Calif.	947
Packard Bell Electronics Corp., Los Angeles 64, Calif.	254
Paktron Div., Illinois Tool Works, Alexandria, Va.	900
Parker Metal Goods Company, Worcester 8, Mass.	929
*Park Products Company, Cleveland 3, Ohio	1011
*PCA Electronics Inc., Sepulveda, Calif.	973
Penn Tran Corporation, Bellefonte, Pa.	665
Penta Laboratories, Inc., Santa Barbara, Calif.	771
*Performance Measurements Company, Detroit 3, Mich.	1094
*Phalo Plastics Corporation, Shrewsbury, Mass.	697
Philco Corporation, Philadelphia 34, Pa.	260
Philco Corporation, Accessory Division, Philadelphia, Pa.	1063
*Philmore Manufacturing Co., Inc., Richmond Hill 18, N. Y.	262
*Pickering and Company, Inc., Plainview, L. I., N. Y.	631
*Piezo Crystal Company, Carlisle, Pa.	501
Pilot Radio Corporation, Long Island City 1, N. Y.	264
Pioneer Electronics Corporation, Los Angeles 64, Calif.	706
*Piper Aircraft Corp., Electronics Div., Vero Beach, Fla.	1130
*Planet Manufacturing Corporation, Bloomfield, N. J.	761
*Polan Industries, Inc., Huntington 19, W. Va.	621
Pomona Electronics Co., Inc., Pomona, Calif.	1050
Precision Apparatus Company, Inc., Glendale 27, Long Island, N. Y.	505
*Precision Electronic Coil Manufacturing Co., Santa Monica, Calif.	982
Precision Electronics Inc., Franklin Park, Ill.	871
*Prodelin, Inc., Kearny, N. J.	703
*Pyramid Electric Company, Darlington, S. C.	472
*Q. L. C. Corporation, Long Valley, N. J.	464
*Quality Transformer & Coil Co., Inc., Chicago 14, Ill.	1005
Quam-Nichols Company, Chicago 37, Ill.	270
*Quik-Chek Corporation, Philadelphia 44, Pa.	743
Quincy Speaker Manufacturing Corp., Quincy, Ill.	767
Radio Condenser Company, Camden 3, N. J.	273
Radio Corporation of America, Camden, N. J.	274
Radio Development & Research Corp., Paterson 3, N. J.	924
*Radio Engineering Laboratories, Inc., Long Island City 1, N. Y.	276
*Radio Industries, Inc., Des Plaines, Ill.	540
Radio Materials Company, Div. P. R. Mallory & Co., Inc., Chicago 18, Ill.	732
The Radion Corporation, Crystal Lake, Ill.	700
Radio Receptor Company, Inc., Sub. General Instrument Corp., Brooklyn 11, N. Y.	380
Radio Specialty Manufacturing Co., Portland 14, Oregon	587
*Radio Television Products Corp., Grass Lake, Mich.	489
Ram Electronics, Inc., Paramus, N. J.	617
Rapid Die and Molding Co., Schiller Park, Ill.	968
*Ratel, Inc., Goleta, Calif.	835
Ratigan Electronics Inc., Glendale 4, Calif.	979
The Rauland Corp., Sub. Zenith Radio Corp., Chicago 41, Ill.	1101
*Raypar, Incorporated, Chicago 34, Ill.	1115
Raytheon Company, Waltham 54, Mass.	280
Red Bank Division, Bendix Corp., Eatontown, N. J.	1012
Resitron Laboratories, Inc., Santa Monica, Calif.	917
Rheem Semiconductor Corp., Mountain View, Calif.	1116
*Rogers Electronic Corp., New York 12, N. Y.	677
The Rola Company, Inc., Div. of The Muter Company, Cleveland 14, Ohio	285
*Rollan Electric Co., Chicago 20, Ill.	721
*Rowe Industries, Toledo 9, Ohio	580
Russell Speaker Company, Chicago 21, Ill.	748
S & A Electronics, Inc., Toledo 5, Ohio	872
*Sampson Electric Products Co., Clinton, N. C.	518
San Fernando Electric Mfg. Co., San Fernando, Calif.	815
Sangamo Electric Company, Electronic Components Division, Springfield, Ill.	658
*Sarkes Tarzian, Inc., Bloomington, Ind.	684
*Savoy Electronics, Inc., Griffin, Ga.	904
Schneider & Marquard, Inc., Newton, N. J.	520
*Schwalm Electronics, Inc., Highland Park, Ill.	1060
*Scientific Components, Inc., Santa Barbara, Calif.	475
Semicon, Inc., Bedford, Mass.	1118
Sentinel Radio Company, Sub. Magnavox Company, Evanston, Ill.	291
Sheffco Mfg. Corp., Fairview, N. J.	698
*Sherold Crystals Inc., Kansas City 8, Mo.	975
*Sherron Electronics Company, Brooklyn 37, N. Y.	293
Shurite Meters, Sub. of J-B-T Instruments, Inc., New Haven 8, Conn.	484
F. W. Sickles Division, General Instrument Corp., Chicopee, Mass.	294
Simpson Electric Company, Chicago 44, Ill.	614
Skiatron Electronics & Television Corp., New York 14, N. Y.	931
*Paul Smith, Inc., Cincinnati 9, Ohio	1070

Company	Code No.
*SNC Manufacturing Co., Inc., Oshkosh, Wis.	1080
*Solar Manufacturing Corporation, Los Angeles 58, Calif.	296
*Sonotone Corporation, Elmsford, N. Y.	787
Soundolier, Inc., St. Louis 22, Mo.	1026
*Southern Electronics Company, Greeneville, Tenn.	891
*South Haven Coil, Inc., South Haven, Mich.	1066
*Sparton Electronics, Division of Sparton Corporation, Jackson, Mich.	299
Speer Resistor Division, Speer Carbon Company, Bradford, Penna.	300
*Spencer Kennedy Laboratories, Inc., Boston 35, Mass.	782
Sprague Electric Company, North Adams, Mass.	303
Sprague of Wisconsin, Inc., Grafton, Wis.	457
Stackpole Carbon Company, St. Marys 3, Pa.	304
*Standard Kollsman Industries, Inc., Melrose Park, Ill.	305
*Standard Condenser Corp., Chicago 13, Ill.	710
Standard Components Corp., Sub. Litton Industries, Inc., Mt. Vernon, N. Y.	1124
*Standard Electrical Products Co., Dayton 3, Ohio	668
Standard Rectifier Corporation, Santa Ana, Calif.	1113
Standard Television Tube Corp., New Orleans 19, La.	922
*Standard Winding Company, Newburgh, N. Y.	550
The Staver Company Incorporated, Bay Shore, L. I., N. Y.	604
Stone City Products Co., Bedford, Ind.	770
Stromberg-Carlson, Div. of General Dynamics Corp., Rochester 3, N. Y.	308
*Sun Capacitors, Chicago 25, Ill.	1061
*Superior Resistor and Electronics Corp., Frankfort, Ind.	1121
*Supreme Transformer Corporation, Chicago 39, Ill.	798
Surprenant Mfg. Co., Boston 8, Mass.	624
Switchcraft, Inc., Chicago 30, Ill.	1000
Sylvania Electric Products Inc., New York 19, N. Y.	312
*Symphonic Electronic Corp., New York 19, N. Y.	351
Syncro Corporation, Electronics Div., Hicksville, Ohio	1081
*Syntronic Instruments, Inc., Addison, Ill.	822
Talk-A-Phone Co., Chicago 25, Ill.	132
Tansitor Electronics, Inc., Bennington, Vt.	988
*Tech-Master Corporation, Brooklyn 1, N. Y.	679
Technical Training Institute, Portland 11, Ore.	921
*Technitrol Engineering Company, Philadelphia 34, Pa.	1102
Telechrome Mfg. Corp., Amityville, N. Y.	868
Tele-Dynamics Div., American Bosch Arma Corp., Philadelphia 31, Pa.	1095
*Teleradio Engineering Corporation, Wilkes Barre, Pa.	357
*TELvision Laboratories, Inc., Wauconda, Ill.	608
*Tempel Steel Company, Chicago 26, Ill.	745
Texas Instruments Incorporated, Dallas 9, Tex.	980
*Thomas & Skinner Inc., Indianapolis 7, Ind.	318
Thomas Electronics, Inc., Passaic, N. J.	672
*Thordarson-Meissner, Mt. Carmel, Ill.	238
*Todd Electric Company, Inc., Yonkers, N. Y.	926
*B. J. Toegel, Inc., Plainfield, N. J.	548
*Topic Electronics, Inc., Natick, Mass.	1098
*Torwico Electronics, Inc., Union, N. J.	1025
*Transcon Manufacturing Co., Dallas 9, Tex.	1084
*Transformer-Electronics Company, Boulder, Colo.	1132
*Transformer Manufacturers, Inc., Chicago 30, Ill.	1052
Transitron Electronic Corporation, Wakefield, Mass.	959
Translite Electronics Corp., Chicago 39, Ill.	810
Trav-Ler Radio Corporation, Chicago 6, Ill.	320
Tresco, Inc., Philadelphia 28, Penna.	897
Triad Transformer Corp., Sub. Litton Industries, Venice, Calif.	830
Triplett Electrical Instrument Co., Bluffton, Ohio	321
*Tritron Company, Milwaukee 12, Wis.	1085
*Triwec-Transformer Company, Chicago 18, Ill.	524
Tung-Sol Electric Inc., Newark 4, N. J.	322
*Underwood Electric & Mfg. Co., Inc., Chicago 39, Ill.	1073
Union City Filament Corp., Union City, N. J.	954
*Union Electric & Manufacturing Co., Jersey City 7, N. J.	804
United Condenser Corporation, New York 56, N. Y.	516
United Electronics Company, Newark 4, N. J.	323
*United Electronic Manufacturing Corp., Union City, N. J.	820
*United States Radium Corporation, Morristown, N. J.	324
United Transformer Corporation, New York 13, N. Y.	418
*Utah Radio Products Corp., Huntington, Ind.	328
Utrad Corporation, Sub. Litton Industries, Huntington, Ind.	1036
Valpey Crystal Corporation, Holliston, Mass.	527
Varian Associates, Palo Alto, Calif.	809
Vector Electronic Company, Inc., Glendale, Calif.	971
*Videocraft Manufacturing Co., Chicago 39, Ill.	824
*Viking Industries Inc., Canoga Park, Calif.	896
Vitramon, Inc., Bridgeport 1, Conn.	956
*V-M Corporation, Benton Harbor, Mich.	857
*Vokar Products, Inc., Ann Arbor, Mich.	168
Volkert Stampings, Inc., Queens Village 29, L. I., N. Y.	507
*Ward Leonard Electric Co., Mount Vernon, N. Y.	532
Warwick Manufacturing Corporation, Chicago 48, Ill.	332
Waterman Products Company, Inc., Philadelphia 25, Pa.	431
Waters Conley Company, Inc., Rochester, Minn.	382
*WEBCOR, Inc., Chicago 39, Ill.	375
Weller Electric Corp., Easton, Pa.	662
*Wells Manufacturing Company, South Bend 23, Ind.	1074
Wells-Gardner Electronics Corporation, Chicago 39, Ill.	334
Wm. H. Welsh Co., Inc., Chicago 16, Ill.	335
*Wesco Electrical Co., Inc., Greenfield, Mass.	1067
Western Electric Company, Inc., New York 5, N. Y.	336
Westinghouse Electric Corporation, Baltimore 3, Md.	337
Westinghouse Electric Corp., Director Systems Dept., Pittsburgh 6, Pa.	1090
Wheeler Electronic Corp., Sub. Sperry Rand Corp., Waterbury 20, Conn.	392
Wheeler Laboratories, Inc., Sub., Hazeltine, Corp., Great Neck, N. Y.	529
*Whitewater Electronics Inc., Whitewater, Wis.	758
*Wilcox Electric Company, Inc., Kansas City 27, Mo.	339
*Winchester Electronics, Inc., Norwalk, Conn.	1082
Winston Electronics, Div. Jetronic Industries, Miami 42, Fla.	957
*Wirco Electronics, Inc., El Monte, Calif.	1049
*Woodward-Schumacher Electric Corp., Chicago 22, Ill.	606
*Worthco Corporation, Beverly Hills, Calif.	785
Wright Zimmerman, Inc., New Brighton, Minn.	683
*The Wurlitzer Company, Corinth. Miss.	1107
*Yardney Electric Corp., New York 13, N. Y.	1108
*The Zell Products Corp., Norwalk, Conn.	342
Zenith Radio Corporation, Chicago 39, Ill.	343
Z & W Mfg. Corp., Wickliffe, Ohio	819

NUMERICAL LIST

EIA Code Symbols

January 1, 1961

(* Indicates non-members)

Code No.	Company
1	*Fastex Division, Illinois Tool Works, Des Plaines, Ill.
2	*JB Electronic Transformers, Inc., Chicago 47, Ill.
101	*Admiral Corporation, Chicago 47, Ill.
102	Aerovox Corporation, New Bedford, Mass.
106	Allen-Bradley Company, Milwaukee 4, Wis.
107	The Alliance Manufacturing Co., Inc., Alliance, Ohio
110	All Star Products, Inc., Defiance, Ohio
111	Amperex Electronic Corporation, Hicksville, L. I., N. Y.
113	*Andrea Radio Corporation, Long Island City 1, N. Y.
115	A. R. F. Products, Inc., River Forest, Ill.
116	The Arnold Engineering Company, Sub. of Allegheny Ludlum Steel Corp., Marengo, Ill.
119	Automatic Manufacturing Division, General Instrument Corp., Newark 4, N. J.
120	*Automatic Radio Mfg. Co., Inc., Boston 15, Mass.
122	The Bead Chain Manufacturing Co., Bridgeport 5, Conn.
125	Bendix Radio, Division of Bendix Corporation, Baltimore 4, Md.
128	Bliley Electric Company, Erie, Pa.
132	Talk-A-Phone Co., Chicago 25, Ill.
133	C. F. Cannon Co., Springwater, N. Y.
134	Centralab, Div. of Globe-Union Inc., Milwaukee 1, Wis.
135	Chicago Condenser Corporation, Chicago 47, Ill.
137	CTS Corporation, Elkhart, Ind.
138	*Chicago Standard Transformer Division, Essex Wire Corp., Chicago 18, Ill.
139	Cinch Manufacturing Company, Chicago 24, Ill.
140	Clarostat Mfg. Co., Inc., Dover, New Hampshire
141	*Coil Engineering & Mfg. Co., Inc., Roanoke, Ind.
145	*Cinaudagraph Inc., Chicago 26, Ill.
146	Continental-Wirt Electronics Corp., Philadelphia 44, Pa.
148	Corning Glass Works, Corning, N. Y.
151	Croname, Incorporated, Chicago 48, Ill.
152	Crosley Division, Avco Corp., Cincinnati 25, Ohio
155	*DeWald, Div. of United Scientific Labs., Inc., Long Island City 1, N. Y.
156	*Wilbur B. Driver Company, Newark 4, N. J.
158	Allen B. DuMont Laboratories, Clifton, N. J.
159	*DX Radio Products Company, Inc., Chicago 47, Ill.
160	*Hugh H. Eby Company, Philadelphia 44, Penna.
162	Eitel-McCullough, Inc., San Carlos, Calif.
163	Hi-Q Division Aerovox Corporation, Olean, N. Y.
164	The Electro Motive Mfg. Co., Inc., Willimantic, Conn.
166	*Chicago Electronic Engineering Co., Chicago 47, Ill.
168	*Vokar Products, Inc., Ann Arbor, Mich.
169	*Electronic Specialty Co., Los Angeles 39, Calif.
170	Electronic Tube Corporation, Philadelphia 18, Pa.

Code No.	Company
171	*Emerson Radio & Phonograph Corp., Jersey City 2, N. J.
172	Ensign Coil Company, Chicago 23, Ill.
173	Erie Resistor Corporation, Erie, Pa.
174	Espey Mfg. & Electronics Corp., Saratoga Springs, N. Y.
175	*Essex Wire Corporation, Fort Wayne 6, Ind.
178	John E. Fast & Company, Chicago 18, Ill.
179	ITT Federal Laboratories, Clifton, N. J.
185	Motorola Inc., Chicago 51, Ill.
188	General Electric Company, Syracuse 1, N. Y.
189	*General Electronics, Inc., Paterson 3, N. J.
190	The General Industries Company, Elyria, Ohio
191	General Instrument Corporation, Newark 4, N. J.
193	General Magnetic Corporation, Detroit 34, Mich.
194	General Radio Company, West Concord, Mass.
197	The Fred Goat Co., Inc., Brooklyn 17, N. Y.
198	*Guthman Division, Essex Wire Corp., Chicago 7, Ill.
199	*The Hallicrafters Company, Chicago 24, Ill.
200	Olympic Radio & Television, Div. The Siegler Corp., Long Island City 1, N. Y.
201	Hammarlund Mfg. Co., Sub. of Telechrome Mfg. Corp., Amityville, N. Y.
204	Hawley Products Company, St. Charles, Ill.
207	Hoffman Electronics Corporation, Los Angeles 7, Calif.
210	CBS Electronics, Division of Columbia Broadcasting System, Inc., Danvers, Mass.
211	*The Indiana Steel Products Company, Valparaiso, Ind.
214	International Resistance Company, Philadelphia 8, Pa.
216	Jackson Electrical Instrument Co., Dayton 2, Ohio
218	*Jefferson Electric Company, Bellwood, Ill.
220	Jensen Manufacturing Company, Div. of The Muter Company, Chicago 38, Ill.
221	JFD Electronics, Inc., Brooklyn 4, N. Y.
222	E. F. Johnson Company, Inc., Waseca, Minn.
224	Kester Solder Company, Chicago 39, Ill.
225	King Laboratories, Inc., Syracuse 3, N. Y.
227	Lear, Inc., Santa Monica, Calif.
228	Lenz Electric Manufacturing Co., Chicago 47, Ill.
230	Littelfuse, Incorporated, Des Plaines, Ill.
231	Machlett Laboratories, Inc., Sub. of Raytheon Co., Springdale, Conn.
232	The Magnavox Company, Fort Wayne 4, Ind.
235	P. R. Mallory & Co., Inc., Indianapolis 6, Ind.
236	Measurements Div., McGraw-Edison Co., Boonton, N. J.
238	*Thordarson-Meissner, Mt. Carmel, Ill.
239	Merit Coil & Transformer Corp., Hollywood, Fla.
240	Micamold Electronics Manufacturing Corp., Sub. General Instrument Corp., Newark 4, N. J.
242	James Millen Manufacturing Co., Inc., Malden 48, Mass.
244	The Muter Company, Chicago 5, Ill.
245	*National Company, Inc., Malden 48, Mass.
248	Arvin Industries, Inc., Columbus, Ind.
249	Oak Mfg. Co., Crystal Lake, Ill.
250	The Ohio Carbon Company, Cleveland 11, Ohio
251	Ohmite Manufacturing Company, Skokie, Ill.
252	DuKane Corporation, St. Charles, Ill.
254	Packard Bell Electronics Corp., Los Angeles 64, Calif.
260	Philco Corporation, Philadelphia 34, Pa.
262	*Philmore Manufacturing Co., Inc., Richmond Hill 18, N. Y.
264	Pilot Radio Corporation, Long Island City 1, N. Y.
270	Quam-Nichols Company, Chicago 37, Ill.
273	Radio Condenser Company, Camden 3, N. J.
274	Radio Corporation of America, Camden, N. J.
276	*Radio Engineering Laboratories, Inc., Long Island City 1, N. Y.
280	Raytheon Company, Waltham 54, Mass.
285	The Rola Company, Inc., Div. of The Muter Company, Cleveland 14, Ohio
286	Advance Ross Electronics Corp., Chicago 45, Ill.
291	Sentinel Radio Company, Sub. Magnavox Company, Evanston, Ill.
293	*Sherron Electronics Company, Brooklyn 37, N. Y.
294	F. W. Sickles Division, General Instrument Corp., Chicopee, Mass.
296	*Solar Manufacturing Corporation, Los Angeles 58, Calif.
299	*Sparton Electronics, Division of Sparton Corporation, Jackson, Mich.
300	Speer Resistor Division, Speer Carbon Company, Bradford, Pa.
303	Sprague Electric Company, North Adams, Mass.
304	Stackpole Carbon Company, St. Marys 3, Pa.
305	*Standard Kollsman Industries, Inc., Melrose Park, Ill.
308	Stromberg-Carlson, Div. of General Dynamics Corp., Rochester 3, N. Y.
312	Sylvania Electric Products Inc., New York 19, N. Y.
318	*Thomas & Skinner, Inc., Indianapolis 7, Ind.
320	Trav-Ler Radio Corporation, Chicago 6, Ill.
321	Triplett Electrical Instrument Co., Bluffton, Ohio
322	Tung-Sol Electric Inc., Newark 4, N. J.
323	United Electronics Company, Newark 4, N. J.
324	*United States Radium Corporation, Morristown, N. J.
328	*Utah Radio Products Corp., Huntington, Ind.
332	Warwick Manufacturing Corporation, Chicago 48, Ill.
334	Wells-Gardner Electronics Corporation, Chicago 39, Ill.
335	Wm. H. Welsh Co., Inc., Chicago 16, Ill.
336	Western Electric Company, Inc., New York 5, N. Y.
337	Westinghouse Electric Corporation, Baltimore 3, Md.
338	Daystrom, Inc., Newark 12, N. J.
339	*Wilcox Electric Company, Inc., Kansas City 27, Mo.
342	*The Zell Products Corp., Norwalk, Conn.
343	Zenith Radio Corporation, Chicago 39, Ill.
351	*Symphonic Electronic Corp., New York 19, N. Y.
352	*Magnetic Windings Division, Essex Wire Corporation, Easton, Penna.
357	*Teleradio Engineering Corporation, Wilkes Barre, Pa.
360	Gavitt Wire & Cable Co., Division Amerace Corp., Brookfield, Mass.
366	*NYT Manufacturing Co., Inc., Alpha, N. J.
371	*Best Manufacturing Co., Inc., Irvington 11, N. J.
372	*Holyoke Wire and Cable Corporation, Holyoke, Mass.
375	*WEBCOR, Inc., Chicago 39, Ill.
376	Hazeltine Corporation, Little Neck, 62, N. Y.
380	Radio Receptor Company, Inc., Sub. General Instrument Corp., Brooklyn 11, N. Y.
382	Waters Conley Company, Inc., Rochester, Minn.
385	*Dearborn Glass Company, Bedford Park, Ill.
391	Altec Lansing Corporation, Anaheim, Calif.
392	Wheeler Electronic Corp., Sub. Sperry Rand Corp., Waterbury 20, Conn.
394	*Foster Transformer Company, Cincinnati 23, Ohio
402	Andrew Corporation, Chicago 19, Ill.
409	British Industries Corporation, Port Washington, L. I., N. Y.
411	Hardwick, Hindle, Inc., Newark 5, N. J.
413	*Acme Electric Corporation, Cuba, N. Y.
418	United Transformer Corporation, New York 13, N. Y.
423	North American Philips Company, Inc., New York 17, N. Y.
425	*Essex Electronics, Berkeley Heights, N. J.
427	*Communication Measurements Laboratory, Inc., Plainfield, N. J.
431	Waterman Products Company, Inc., Philadelphia 25, Pa.
433	*Cleveland Electronics, Inc., Cleveland 3, Ohio
437	*Newcomb Electronics Corporation, Hollywood 38, Calif.
438	The Gudeman Company, Chicago 10, Ill.
439	Collins Radio Company, Cedar Rapids, Ia.
440	*Cannon Electric Company, Los Angeles 31, Calif.
442	J-B-T Instruments, Inc., New Haven 8, Conn.
446	Good-All Electric Mfg. Co., Ogallala, Nebr.
450	*Columbus Process Co., Inc., Columbus, Ind.
457	Sprague of Wisconsin, Inc., Grafton, Wis.
461	Barker & Williamson, Inc., Bristol, Penna.
464	*Q. L. C. Corporation, Long Valley, N. J.
465	Oxford Electric Corporation, Chicago 15, Ill.
466	Delco Radio Division, General Motors Corporation, Kokomo, Ind.
467	The Grigsby Company, Inc., Arlington Heights, Ill.
472	*Pyramid Electric Company, Darlington, S. C.
475	*Scientific Components, Inc., Santa Barbara, Calif.
484	Shurite Meters, Sub. of J-B-T Instruments, Inc., New Haven 8, Conn.
489	*Radio Television Products Corp., Grass Lake, Mich.
501	*Piezo Crystal Company, Carlisle, Pa.
503	Caledonia Electronics & Transformer Corp., Caledonia, N. Y.
504	*The James Knights Company, Sandwich, Ill.
505	Precision Apparatus Company, Inc., Glendale 27, Long Island, N. Y.
507	Volkert Stampings, Inc., Queens Village 29, L. I., N. Y.
508	The Hickok Electrical Instrument Co., Cleveland 8, O.
515	*Electronic Components Corporation, Addison, Ill.
516	United Condenser Corporation, New York 56, N. Y.
518	*Sampson Electric Products Co., Clinton, N. C.
520	Schneider & Marquard, Inc., Newton, N. J.
524	*Triwec Transformer Company, Chicago 18, Ill.
527	Valpey Crystal Corporation, Holliston, Mass.
529	Wheeler Laboratories, Inc., Sub., Hazeltine Corp., Great Neck, N. Y.
530	*Clippard Instrument Laboratory, Inc., Cincinnati 39, Ohio
532	*Ward Leonard Electric Co., Mount Vernon, N. Y.
540	*Radio Industries, Inc., Des Plaines, Ill.
541	*Industrial Television, Inc., Clifton, N. J.
545	*Electronic Enterprises, Inc., Newark 4, N. J.
547	*Anaconda Wire & Cable Company, Hastings-on-Hudson 6, N. Y.
548	*B. J. Toegel, Inc., Plainfield, N. J.
549	*Mid-West Coil & Transformer Co., Chicago 14, Ill.
550	*Standard Winding Company, Newburgh, N. Y.
551	American Television & Radio Co., St. Paul 1, Minn.

Code No.	Company
552	*Otis Radio & Electric Corp., Hawarden, Iowa
554	Amphenol-Borg Electronics Corp., Broadview, Ill.
563	J. W. Davis & Company, Dallas 35, Texas
569	*Electrical Utilities Company, La Salle, Ill.
570	*Leonard Electric Products Co., Inc., Brooklyn 32, N. Y.
571	*General Cable Corporation, New York 17, N. Y.
572	*F. & V. Coil Winding Corporation, Newark 5, N. J.
573	Alcon Metal Products, Inc., Chicago 47, Ill.
575	*Heppner Manufacturing Company, Round Lake, Ill.
579	Belden Manufacturing Company, Chicago 44, Ill.
580	*Rowe Industries, Toledo 9, Ohio
582	*General Precision Inc., GPL Division, Pleasantville, N. Y.
586	Drake Manufacturing Company, Chicago 31, Ill.
587	Radio Specialty Manufacturing Co., Portland 14, Ore.
589	Bogen-Presto Division, The Siegler Corp., Paramus, N. J.
593	Kip Electronics Corporation, Stamford, Conn.
594	*Kobzy Tool Company, Chicago 22, Ill.
596	*Gramer-Halldorson Transformer Corp., Chicago 39, Ill.
599	*Elco Corporation, Philadelphia 24, Penna.
604	The Staver Company Incorporated, Bay Shore, L. I., N. Y.
606	*Woodward-Schumacher Electric Corp., Chicago 22, Ill.
607	Consolidated Wire & Associated Companies, Chicago 16, Ill.
608	*TELvision Laboratories, Inc., Wauconda, Ill.
610	Carter Parts Company, Skokie, Ill.
614	Simpson Electric Company, Chicago 44, Ill.
616	Illinois Condenser Company, Chicago 22, Ill.
617	Ram Electronics, Inc., Paramus, N. J.
620	Kay Electric Company, Pine Brook, N. J.
621	*Polan Industries, Inc., Huntington 19, W. Va.
624	Surprenant Mfg. Co., Boston 8, Mass.
628	*Davis Electric Company, Cape Girardeau, Mo.
631	*Pickering and Company, Inc., Plainview, L. I., N. Y.
632	*El-Rad Manufacturing Co., Chicago 18, Ill.
637	*Central Coil Company, Indianapolis 22, Ind.
638	Industrial Development Engineering Associates, Inc., Indianapolis 26, Ind.
642	Mycalex Corporation of America, Clifton, N. J.
643	*National Aeronautical Corporation, Fort Washington, Pa.
644	General Railway Signal Company, Rochester 2, N. Y.
647	Kimble Glass Company, Sub. of Owens-Illinois Glass Co., Toledo 1, Ohio
648	*American Radionic Co., Inc., Danbury, Conn.
649	*Electro-Voice, Inc., Buchanan, Mich.
657	Lowell Manufacturing Company, St. Louis 17, Mo.
658	Sangamo Electric Company, Electronic Components Division, Springfield, Ill.
662	Weller Electric Corp., Easton, Pa.
665	Penn Tran Corporation, Bellefonte, Penna.
668	*Standard Electrical Products Co., Dayton, 3, Ohio
670	Glaser-Steers Corporation, Newark 4, N. J.
672	Thomas Electronics, Inc., Passaic, N. J.
677	*Rogers Electronic Corp., New York 12, N. Y.
679	*Tech-Master Corporation, Brooklyn 1, N. Y.
680	Conrac Incorporated, Glendora, Calif.
681	*American Lava Corporation, Chattanooga 5, Tenn.
682	*Electrical Windings, Inc., Chicago 39, Ill.
683	Wright Zimmerman, Inc., New Brighton, Minn.
684	*Sarkes Tarzian, Inc., Bloomington, Ind.
687	*Hillburn Electronics Corp., Brooklyn 22, N. Y.
689	Aladdin Electronics, a Division of Aladdin Industries, Incorporated, Nashville 10, Tenn.
692	CELCO (Constantine Engineering Laboratories Co.), Mahwah, N. J.
693	Multi-Tron Laboratory, Inc., Westchester, Ill.
695	Basler Electric Company, Highland, Ill.
697	*Phalo Plastics Corporation, Shrewsbury, Mass.
698	Sheffco Mfg. Corp., Fairview, N. J.
699	*Keystone Electronics Company, Newark 4, N. J.
700	*The Radion Corporation, Crystal Lake, Ill.
701	Forbes & Wagner, Inc., Silver Creek, N. Y.
703	*Prodelin, Inc., Kearny, N. J.
704	Cosmic Radio Corporation, New York 59, N. Y.
705	*Ajax Condenser Co., Inc., Chicago 14, Ill.
706	Pioneer Electronics Corporation, Los Angeles 64, Calif.
710	*Standard Condenser Corp., Chicago 13, Ill.
719	*Carbonneau Industries, Grand Rapids 2, Mich.
720	*Methode Manufacturing Corp., Chicago 31, Ill.
721	*Rollan Electric Co., Chicago 20, Ill.
722	Milwaukee Resistor Co., Milwaukee 4, Wis.
723	Northwest Plastics, Inc., St. Paul 7, Minn.
724	Jeffers Electronics Division, Speer Carbon Company, Dubois, Penna.
730	Jersey Specialty Co., Inc., Mountainview, N. J.
732	Radio Materials Company, Div. P. R. Mallory & Co., Inc. Chicago 18, Ill.
733	Alpha Metals, Inc., Jersey City 4, N. J.
740	*Olympic Products Co., Inc., Alpha 1, N. J.
742	*Esquire Radio Corporation, Brooklyn 19, N. Y.
743	*Quik-Chek Corporation, Philadelphia 44, Pa.
744	Hughes Aircraft Company, Culver City, Calif.
745	*Tempel Steel Company, Chicago 26, Ill.
746	*L. H. Frost & Co., Inc., Grand Rapids 8, Mich.
748	Russell Speaker Company, Chicago 21, Ill.
749	*National Electronics, Incorporated, Geneva, Ill.
750	Mosley Electronics, Incorporated, Bridgeton, Mo.
752	*Electronic Devices, Inc., New Rochelle, N. Y.
757	*Grand Transformers, Inc., Grand Haven, Mich.
758	*Whitewater Electronics Inc., Whitewater, Wis.
761	*Planet Manufacturing Corp., Bloomfield, N. J.
762	Erca Tool Die & Stamping Co., Brooklyn 22, N. Y.
767	Quincy Speaker Manufacturing Corp., Quincy, Ill.
768	*Microtran Company, Inc., Valley Stream, L. I., N. Y.
770	Stone City Products Co., Bedford, Ind.
771	Penta Laboratories, Inc., Santa Barbara, Calif.
773	*The Forest Electric Company, Forest Park, Ill.
776	*Ogden Coil & Transformer Co., Chicago 23, Ill.
780	*DeJur-Amsco Corporation, Long Island City 1, N. Y.
782	*Spencer Kennedy Laboratories, Inc., Boston 35, Mass.
784	Johnson Electronics Inc., Casselberry, Fla.
785	*Worthco Corporation, Beverly Hills, Calif.
786	*Hinners-Galanek Radio Corp., Cavalier Radio & Television Div., Forest Hills 74, N. Y.
787	*Sonotone Corporation, Elmsford, N. Y.
789	McGregor Electronic Industries, Inc., McGregor, Ia.
791	*Hopkins Engineering Company, San Fernando, Calif.
792	Atlantic Wire & Cable Corp., College Point 56, N. Y.
793	*McIntosh Laboratory, Inc., Binghamton, N. Y.
794	Harman-Kardon, Inc., Plainview, L. I., N. Y.
798	*Supreme Transformer Corporation, Chicago 39, Ill.
799	*California Magnetic Control Corp., North Hollywood, Calif.
804	*Union Electric & Manufacturing Company, Jersey City 7, N. J.
806	*Gordos Corporation, Bloomfield, N. J.
808	*Henald Manufacturing Co. Inc., Piper City, Ill.
809	Varian Associates, Palo Alto, Calif.
810	Translite Electronics Corp., Chicago 39, Ill.
811	Continental Electronics Corp. of Calif., Los Angeles 58, Calif.
812	*Bradley Semiconductor Corporation, New Haven 11, Conn.
813	Adler Electronics Inc., New Rochelle, N. Y.
815	San Fernando Electric Mfg. Co., San Fernando, Calif.
816	Dale Electronics Inc., Columbus, Nebr.
819	Z & W Mfg. Corp., Wickliffe, Ohio
820	*United Electronic Manufacturing Corp., Union City, N. J.
822	*Syntronic Instruments, Inc., Addison, Ill.
824	*Videocraft Manufacturing Co., Chicago 39, Ill.
828	Midland Manufacturing Co., Inc., Kansas City 15, Kan.
830	Triad Transformer Corp., Sub. Litton Industries, Venice, Calif.
831	*Better Coil & Transformer Corp., Goodland, Ind.
832	McCoy Electronics Co., Mt. Holly Springs, Penna.
834	*Mel-Rain Corporation, Indianapolis 3, Ind.
835	*Ratel, Inc., Goleta, Calif.
836	*National Video Corporation, Chicago 32, Ill.
837	*Carol Electronics Corporation, Martinsburg, W. Va.
839	*Crest Transformer Corp., Hoopeston, Ill.
840	Ampex Magnetic Tape Products, Div. Ampex Corp., Opelika, Ala.
841	Central Electronic Manufacturers, Denville, N. J.
845	International Rectifier Corporation, El Segundo, Calif.
848	Onondaga Electronics Div., Speer Carbon Co. Syracuse 1, N. Y.
851	R. L. Drake Company, Miamisburg, Ohio
852	Andrews Tower, Inc., Fort Worth 19, Tex.
856	Clevite Transistor, Div. of Clevite Corp., Waltham 54, Mass
857	*V-M Corporation, Benton Harbor, Mich.
863	*James Electronics, Inc., Chicago 18, Ill.
866	*Industrial Electronic Corporation, New York 12, N. Y.
867	C-B-C Electronics Co., Inc., Philadelphia 20, Pa.
868	Telechrome Mfg. Corp., Amityville, N. Y.
869	*Kline Iron and Steel Company, Columbia, S. C.
870	Cubic Corporation, San Diego 11, Calif.
871	Precision Electronics Inc., Franklin Park, Ill.
872	S & A Electronics, Inc., Toledo 5, Ohio
879	Litton Industries, Beverly Hills, Calif.
883	*Albergo Transformer Company, Chicago 22, Ill.
885	M.E.C., Inc., Nashville, Tenn.
886	*Calvideo Tube Corporation, Compton, Calif.
888	Connector Corporation, Chicago 30, Ill.
891	*Southern Electronics Company, Greeneville, Tenn.
892	*American Transformer Corp., Chicago 7, Ill.
893	Armel Electronics Inc., North Bergen, N. J.
894	Hy-Gain Antenna Products Corp., Lincoln, Nebr.
895	*Dinion Coil Co., Inc., Caledonia, N. Y.
896	*Viking Industries Inc., Canoga Park, Calif.
897	Tresco, Inc., Philadelphia 28, Penna.
898	Convair/Pomona, Div. of General Dynamics Corp., Pomona, Calif.

Code No.	Company
900	Paktron Div., Illinois Tool Works, Alexandria, Va.
902	EMCOR-Ingersoll Products Div., Borg-Warner Corp., Elgin, Ill.
903	Electro-Products, Inc., Detroit 27, Mich.
904	*Savoy Electronics, Inc., Griffin, Ga.
906	*Coilcraft, Incorporated, Cary, Ill.
909	*Chester Cable Corp., Chester, N. Y.
910	*Aerolite Electronics Corp., Union City, N. J.
911	International Electronics Industries, Inc., Nashville 4, Tenn.
912	*Blackburn Electronic Corporation, Wyoming, Pa.
913	General Products Corporation, Union Springs, N. Y.
915	*Inductor Engineering, Inc., Lewes, Del.
917	Resitron Laboratories, Inc., Los Angeles 25, Calif.
918	*Oaktron Industries Inc., Monroe, Wis.
920	The Antenna Specialists Co., Cleveland 6, Ohio
921	Technical Training Institute, Portland 11, Ore.
922	Standard Television Tube Corp., New Orleans 19, La.
923	Jerrold Electronics Corporation, Philadelphia 32, Pa.
924	Radio Development & Research Corp., Paterson 3, N. J.
926	*Todd Electric Company, Inc., Yonkers, N. Y.
927	General Mills, Inc., Mechanical Division, Minneapolis 13, Minn.
928	*Acme Coil & Transformer Corp., Chicago 14, Ill.
929	Parker Metal Goods Company, Worcester 8, Mass.
931	Skiatron Electronics & Television Corp., New York 14, N. Y.
933	*Magnetic Coil Manufacturing Company, Chicago 22, Ill.
934	*Oaktron Electric Company, Tinley Park, Ill.
935	Electrons, Incorporated, Newark 3, N. J.
936	*Hamilton-Hall Resistor Corp., Milwaukee 2, Wis.
938	ITT Federal Laboratories, Fort Wayne, Ind.
940	Bomac Laboratories, Inc., Sub. Varian Associates, Beverly, Mass.
941	*Electronic Engineering Company of California, Santa Ana, Calif.
947	Pacific Semiconductors, Inc., Lawndale, Calif.
949	*Apex Coil and Transformer Corporation, Chicago 8, Ill.
954	Union City Filament Corp., Union City, N. J.
956	Vitramon, Inc., Bridgeport 1, Conn.
957	Winston Electronics, Div. Jetronic Industries, Miami 42, Fla.
959	Transitron Electronic Corporation, Wakefield, Mass.
960	*Ontario Industries, Inc., Hornell, N. Y.
961	Anton Electronic Laboratories, Inc., Brooklyn 37, N. Y.
963	Foto-Video Laboratories, Inc., Cedar Grove, N. J.
964	Huggins Laboratories, Inc., Sunnyvale, Calif.
965	Moloney Electric Company, St. Louis 20, Mo.
967	North American Aviation, Inc., Los Angeles 45, Calif.
968	Rapid Die and Molding Co., Schiller Park, Ill.
971	Vector Electronic Company, Inc., Glendale, Calif.
973	*PCA Electronics Inc., Sepulveda, Calif.
974	*Lectrohm, Inc., Chicago 30, Ill.
975	*Sherold Crystals Inc., Kansas City 8, Mo.
976	*Model Engineering & Manufacturing, Inc., Chicago 18, Ill.
977	*Filtors, Inc., Port Washington, L. I., N. Y.
978	American Electronics Company, Mineola, L. I., N. Y.
979	Ratigan Electronics Inc., Glendale 4, Calif.
980	Texas Instruments Incorporated, Dallas 9, Tex.
982	*Precision Electronic Coil Manufacturing Company, Santa Monica, Calif.
984	*Electro-Winders Co., Inc., Covina, Calif.
985	*Bartlett Manufacturing Company, Glenview, Ill.
986	Delevan Electronics Corp., East Aurora, N. Y.
987	*Florida-Merit Inc., Hollywood, Fla.
988	Tansitor Electronics, Inc., Bennington, Vt.
989	*Marvel Electric Corporation, Chicago 22, Ill.
990	Semiconductor Div., General Instrument Corp., Newark 4, N. J.
992	Grayhill, La Grange, Ill.
993	*Midwest Speaker Company, McGregor, Iowa
996	*Grand Coil Winders, Grand Haven, Mich.
999	*National Tel-Tronics Corp., Yonkers, N. Y.
1000	Switchcraft, Inc., Chicago 30, Ill.
1002	*The Amplifone Corporation, Chicago 40, Ill.
1003	*Fugle-Miller Laboratories, Clark, N. J.
1004	*Jet Electronics Corporation, Azusa, Calif.
1005	*Quality Transformer & Coil Co., Inc., Chicago 14, Ill.
1006	*Fischer Electric Co., Inc., De Leon Springs, Fla.
1007	Hycon Mfg. Company, Pasadena, Calif.
1011	*Park Products Company, Cleveland 3, Ohio
1012	Red Bank Division, Bendix Corp., Long Branch, N. J.
1013	*Ion Capacitor Corp., Columbia City, Ind.
1016	*Kemtron Electron Products, Inc., Newburyport, Mass.
1017	Campbell Industries, Inc., Sub., Clarostat Mfg. Co., Dover, N. H.
1019	Communication Accessories Company, Sub., Collins Radio Co., Lee's Summit, Mo.
1022	International Electronics Corp., New York 12, N. Y.
1023	International Electronic Research Corp., Burbank, Calif.---
1024	Leach Corporation, Compton, Calif.
1025	*Torwico Electronics, Inc., Union, N. J.
1026	Soundolier, Inc., St. Louis 22, Mo.
1028	*Gray & Kuhn, Inc., Westbury, L. I., N. Y.
1030	*ACDC Electronics, Inc., Burbank, Calif.
1031	*A.L.A. Industries, Inc., Harrison, N. Y.
1033	*Electro Engineering Works, San Leandro, Calif.
1035	*Associated Transformer Corp., Chicago 47, Ill.
1036	Utrad Corp., Sub. Litton Industries, Huntington, Ind.
1038	*CapTran Corporation, Chicago 22, Ill.
1040	Ferranti Electric, Inc., Plainview, L. I., N. Y.
1041	*Mayfair Molded Products Corporation, Schiller Park, Ill.
1044	*Bradford Components, Inc., Salamanca, N. Y.
1045	Gremar Manufacturing Co., Inc., Wakefield, Mass.
1048	Columbia Technical Corporation, Woodside 77, N. Y.
1049	*Wirco Electronics, Inc., El Monte, Calif.
1050	Pomona Electronics Co., Inc., Pomona, Calif.
1051	Audio Devices, Inc., New York, N. Y.
1052	*Transformer Manufacturers, Inc., Chicago 30, Ill.
1053	Industro Transistor Corporation, Long Island City 6, N. Y.
1054	Kentron Hawaii Ltd., Honolulu 14, Hawaii
1056	*Gefco Manufacturing Company, Grayslake, Ill.
1058	Entron Incorporated, Bladensburg, Md.
1059	*Channel Master Corporation, Ellenville, N. Y.
1060	*Schwalm Electronics, Inc., Highland Park, Ill.
1061	*Sun Capacitors, Chicago 25, Ill.
1063	Philco Corporation, Accessory Division, Philadelphia, Pa.
1064	Chemtronic Corporation, Nashville 4, Tenn.
1066	*South Haven Coil, Inc., South Haven, Mich.
1067	*Wesco Electrical Co., Inc., Greenfield, Mass.
1068	Callins Industries, Inc., Greenfield, Tenn.
1069	*ESC Electronics Corporation, Palisades Park, N. J.
1070	*Paul Smith, Inc., Cincinnati 9, Ohio
1071	*Caddell-Burns Mfg. Co. Inc., Mineola, N. Y.
1072	*Dresser Electronics, HST Div., Garland, Tex.
1073	*Underwood Electric & Mfg. Co., Inc., Chicago 39, Ill.
1074	*Wells Manufacturing Company, South Bend 23, Ind.
1075	Metals & Controls Div., Texas Instruments Inc., Attleboro, Mass.
1076	*Horton and Hubbard Manufacturing Co., Nashua, N. H.
1077	Cornell-Dubilier Corporation, Fuquay Springs, N. C.
1078	*Lumen, Inc., Joliet, Ill.
1079	Nortronics, A Div. of Northrop Corporation, Hawthorne, Calif.
1080	*SNC Manufacturing Co., Inc., Oshkosh, Wis.
1081	Syncro Corporation, Electronics Div., Hicksville, Ohio
1082	*Winchester Electronics, Inc., Norwalk, Conn.
1083	*Melrose Products, Inc., Willow Grove, Pa.
1084	*Transcon Manufacturing Co., Dallas 9, Tex.
1085	*Tritron Company, Milwaukee 12, Wis.
1086	*Pacific Mercury Electronics, Sepulveda, Calif.
1087	Minneapolis-Honeywell Regulator Co., Semiconductor Products Div., Minneapolis 8, Minn.
1088	*Bristol Motors Div., Vocaline Co. of America, Inc., Old Saybrook, Conn.
1089	*American Magnetics Corporation, Carterville, Ill.
1090	Westinghouse Electric Corp., Director Systems Dept., Pittsburgh 6, Pa.
1092	*Adams Electronics Inc., Bangor, Mich.
1094	*Performance Measurements Company, Detroit 3, Mich.
1095	Tele-Dynamics Div., American Bosch Arma Corp., Philadelphia 31, Pa.
1096	*Johnson Electric Coil Company, Franklin Park, Ill.
1097	*Grand Tran, Inc., Benton Harbor, Mich.
1098	*Topic Electronics, Inc., Natick, Mass.
1100	*Ovenaire, Inc., Charlottesville, Va.
1101	The Rauland Corporation, Chicago 41, Ill.
1102	*Technitrol Engineering Company, Philadelphia 34, Pa.
1103	Columbus Electronics Corp., Semiconductor Div., Yonkers, N. Y.
1104	*Astro-Tran, West Acton, Mass.
1105	National Semiconductor Corporation, Danbury, Conn.
1106	*Efcon, Incorporated, Garden City, L. I., N. Y.
1107	*The Wurlitzer Company, Corinth, Miss.
1108	*Yardney Electric Corp., New York 13, N. Y.
1109	Intelex Systems, Inc., Sub. ITT, New York 4, N. Y.
1110	*Hathaway Instruments, Inc., Denver 22, Colo.
1112	*Indiana Products, Inc., Sub. Standard Electrical Products Co., Richmond, Ind.
1113	Standard Rectifier Corporation, Santa Ana, Calif.
1115	*Raypar, Incorporated, Chicago 34, Ill.
1116	Rheem Semiconductor Corp., Mountain View, Calif.
1117	*Fanon Electronic Industries, Inc., Newark 12, N. J.
1118	Semicon, Inc., Bedford, Mass.
1120	General Electrodynamics Corp., Garland, Tex.
1121	*Superior Resistor and Electronics Corp., Frankfort, Ind.
1122	*Hammond Organ Company, Chicago, Ill.
1123	*Iron Fireman Manufacturing Co., Portland, Ore.
1124	Standard Components Corp., Sub. Litton Industries, Inc., Mt. Vernon, N. Y.

Code No.	Company
1126	*LIECO, Incorporated, Syosset, L. I., N. Y.
1127	*J & D Transformers, Inc., North Chili, N. Y.
1128	*Arco Electronics, Inc., New York 13, N. Y.
1129	*A. J. Fischer, Inc., DeLand, Fla.

Code No.	Company
1130	*Piper Aircraft Corp., Electronics Div., Vero Beach, Fla.
1131	*Hamilton Labs., Inc., Bristol, Pa.
1132	*Transformer-Electronics Company, Boulder, Colo.
1133	*Hindle Transformer Company, Inc., Flemington, N. J.
1134	*Engineered Electronics Company, Santa Ana, Calif.

EIA WEEKLY DATE CODE

SYMBOL OF EACH WEEK IN PERIOD OF JANUARY 1, 1961 TO DECEMBER 30, 1961

Code	Period					
01	January	1	to	January	7	Inc.
02	January	8	to	January	14	"
03	January	15	to	January	21	"
04	January	22	to	January	28	"
05	January	29	to	February	4	"
06	February	5	to	February	11	"
07	February	12	to	February	18	"
08	February	19	to	February	25	"
09	February	26	to	March	4	"
10	March	5	to	March	11	"
11	March	12	to	March	18	"
12	March	19	to	March	25	"
13	March	26	to	April	1	"
14	April	2	to	April	8	"
15	April	9	to	April	15	"
16	April	16	to	April	22	"
17	April	23	to	April	29	"
18	April	30	to	May	6	"
19	May	7	to	May	13	"
20	May	14	to	May	20	"
21	May	21	to	May	27	"
22	May	28	to	June	3	"
23	June	4	to	June	10	"
24	June	11	to	June	17	"
25	June	18	to	June	24	"
26	June	25	to	July	1	"
27	July	2	to	July	8	"
28	July	9	to	July	15	"
29	July	16	to	July	22	"
30	July	23	to	July	29	"
31	July	30	to	August	5	"
32	August	6	to	August	12	"
33	August	13	to	August	19	"
34	August	20	to	August	26	"
35	August	27	to	September	2	"
36	September	3	to	September	9	"
37	September	10	to	September	16	"
38	September	17	to	September	23	"
39	September	24	to	September	30	"
40	October	1	to	October	7	"
41	October	8	to	October	14	"
42	October	15	to	October	21	"
43	October	22	to	October	28	"
44	October	29	to	November	4	"
45	November	5	to	November	11	"
46	November	12	to	November	18	"
47	November	19	to	November	25	"
48	November	26	to	December	2	"
49	December	3	to	December	9	"
50	December	10	to	December	16	"
51	December	17	to	December	23	"
52	December	24	to	December	30	"

EIA WEEKLY DATE CODE

SYMBOL OF EACH WEEK IN PERIOD OF DECEMBER 31, 1961 TO JANUARY 5, 1963

Code	Period					
01	Dec. (1961)	31	to	Jan. (1962)	6	Inc.
02	January	7	to	January	13	"
03	January	14	to	January	20	"
04	January	21	to	January	27	"
05	January	28	to	February	3	"
06	February	4	to	February	10	"
07	February	11	to	February	17	"
08	February	18	to	February	24	"
09	February	25	to	March	3	"
10	March	4	to	March	10	"
11	March	11	to	March	17	"
12	March	18	to	March	24	"
13	March	25	to	March	31	"
14	April	1	to	April	7	"
15	April	8	to	April	14	"
16	April	15	to	April	21	"
17	April	22	to	April	28	"
18	April	29	to	May	5	"
19	May	6	to	May	12	"
20	May	13	to	May	19	"
21	May	20	to	May	26	"
22	May	27	to	June	2	"
23	June	3	to	June	9	"
24	June	10	to	June	16	"
25	June	17	to	June	23	"
26	June	24	to	June	30	"
27	July	1	to	July	7	"
28	July	8	to	July	14	"
29	July	15	to	July	21	"
30	July	22	to	July	28	"
31	July	29	to	August	4	"
32	August	5	to	August	11	"
33	August	12	to	August	18	"
34	August	19	to	August	25	"
35	August	26	to	September	1	"
36	September	2	to	September	8	"
37	September	9	to	September	15	"
38	September	16	to	September	22	"
39	September	23	to	September	29	"
40	September	30	to	October	6	"
41	October	7	to	October	13	"
42	October	14	to	October	20	"
43	October	21	to	October	27	"
44	October	28	to	November	3,	"
45	November	4	to	November	10	"
46	November	11	to	November	17	"
47	November	18	to	November	24	"
48	November	25	to	December	1	"
49	December	2	to	December	8	"
50	December	9	to	December	15	"
51	December	16	to	December	22	"
52	December	23	to	December	29	"
01	December	30	to	Jan. (1963)	5	"